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08/08/05

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# JamIt Patent Search

Enclosed is a draft copy of my Non-Provisional Utility Patent Application to the U. S. Patent and Trademark Office [Form PTO/SB/01 (10-01)] on the Safety Cartridge (called JamIt) and copies of patents of similar devices identified during the patent search. Also enclosed is my original Provisional Patent on the Safety Cartridge which was submitted to the U. S. Patent and Trademark Office on August 1, 2002 and officially recorded as Application Number 60/400.855, Confirmation No. 9832, and Filing Date 08/05/2002. A brief description of the JamIt cartridge, Discussion of Prior Art, and Conclusions is summarized below.

## DESCRIPTION

JamIt is a safety cartridge for loaded semi-automatic / automatic pistol and revolver type handguns. It can also be used to provide safety to loaded bolt action, lever action, pump and automatic rifles and shotguns. Most of the discussion here will be directed at loaded handguns rather than shotguns or rifles because handguns are more commonly used by homeowners, citizens with the right to carry (35 of 50 states have this right including Minnesota) and law enforcement officers for self defense.

JamIt is a safety cartridge which, when fired, jams the gun to prevent the remaining live ammunition from being fired. A simple rod inserted down the barrel may be used by the gun owner to remove the fired JamIt cartridge assembly from the gun allowing live ammunition to be chambered and fired. The gun owner may elect to use one or two JamIt cartridges in his loaded handgun for safety purposes. If an unauthorized person such as a child or criminal attempts to fire the owner's loaded gun equipped with JamIt, the gun becomes jammed and can't be fired. If the owner needs to use his gun for self-defense, he must eject JamIt cartridge(s) (pistol) or rotate the cylinder (revolver) moving the JamIt cartridge(s) out of line with the barrel when the hammer impacts the firing pin. The owner may select to use 2 rather than 1 JamIt cartridge to provide additional safety at the expense of fire power, i.e., sometimes a person picking up a loaded pistol will pull on the slide to verify the gun is loaded causing ejection of the first chambered cartridge (many gun owners do not want a live round of ammunition in the chamber of their pistol for safety reasons).

Removal of a fired JamIt safety cartridge requires that the gun owner have special training which is documented in "FIRED JamIt SAFETY CARTRIDGE REMOVAL INSTRUCTIONS" contained within JamIt packaging. If the gun owner elects to install the special o-ring (contained within the JamIt packaging) to the JamIt slug, the fired JamIt cartridge is much more difficult to remove and may even require the services of a gunsmith. Using the o-ring improves safety further. It would be very difficult for a child or other unauthorized person to remove the fired JamIt safety cartridge equipped with the o-ring. The o-ring causes the slug to become stuck in the barrel. Considerable force (up to 100 pounds or more) must be applied to the slug to move it out of the barrel. A fired JamIt safety cartridge does not damage the firearm.

## DISCUSSION OF PRIOR ART

A patent search was conducted on the Internet using the U. S. Patent and Trademark Office web site, [www.uspto.gov](http://www.uspto.gov). Patents issued between 1790 and 1976 are searchable by patent number and current U. S. classifications [CCL] which for firearm safety and locking mechanisms is CCL/42/70.11 which yielded 407 "hits" from 1790 to 6/21/2003 [a "hit" gives the patent number, patent name (for patents issued after 1976) and U. S. classifications (for patents issued before 1976)]. Patents issued after 1976 (which accounts for approximately 40% of all patents issued in the U. S. as of mid 2003) can be searched using key words and/or combinations of words existing

in the patent text and patent title. The following combinations of words were used to search complete patents (words used in text) and patent titles. The number of "hits" for each word combination:

**Complete Patent Text**

handgun AND safety	425	hits
handgun AND safety AND cartridge	185	hits
handgun AND cartridge	312	hits
handgun AND jam	29	hits

**Patent Title Only**

(firearms AND disabling) OR (cartridge AND disabling)	6	hits
(handgun AND safety) OR (handgun AND cartridge)	10	hits
handgun AND safety	9	hits

Many of the above "hit" groupings contained the same patent numbers. Each of the above hits along with the 407 hits produced from CCL/42/70.11 on patents issued from 1790 to 2003 were reviewed in the search. Also reviewed were References cited in patents on devices remotely similar to the JamIt Safety Cartridge. Many classes of devices were not similar to JamIt; namely:

- Firearm display rack/case locks
- Holster locks
- Magazine locks
- Firing pin locks
- Hammer locks
- Trigger locks
- Electronic devices activated by magnetic ring, finger print, or audio
- Devices requiring handgun modification
- Various lock boxes with combination locks which can be operated in the dark

A list of 14 References is provided in Table 1 along with the JamIt Safety Cartridge for comparison purposes. The patents referred to in Table 1 are attached to this report. These patents had one or more characteristics which were similar to the JamIt Safety Cartridge. Referring now to Table 1 and the attached patents, the first patent on a safety device occupying the chamber of a gun was issued during the Civil War in 1863 to Bonzano (37,946). It was a chamber plug inserted down the tube of a muzzle loaded cannon. This chamber plug was a safety device in that it prevented unauthorized loading of the cannon.

Comparisons of the 14 patents to JamIt can easily be made by examining Table 1. The 5th column in Table 1 shows which type of loaded handgun (pistol, revolver, or both) can be made safe using the various inventions. JamIt along with the Trois & Crawford device (6,418,654), Achee & Zaharek device (6,408,556), Briley, Croft & Schmeck device (5,475,994), Stuart's device (5,394,635 & 5,347,739) and the Thurber device (4,783,924) can provide safety to both loaded pistol and revolver handguns. The other devices listed in Table 1 can be used on only a pistol or only a revolver. The 6th column of Table 1 indicates that only the JamIt, Scott's breech block safety device (6,237,272) and Ross's quick-release gun lock (5,950,344) can provide safety to loaded rifles and shotguns. Scott's device is a simple plug fitted with o-rings placed in the breech of a weapon. Its purpose is to prevent a customer in a store (where the gun is on display) from inserting a live round of ammunition into the gun. The gun's magazine could be loaded with ammunition and the plug would prevent chambering of the ammunition into the gun. The intent of Scott's device is not for owner self defense like JamIt, i.e., it would take a long time to remove the Scott device so that chambering of live ammunition in the magazine could commence. For this reason, the term, slow, is used in column 6 to characterize Scott's device. Ross's device would also be very slow to operate in a self defense situation because a long tool would need to be inserted down the long barrel to reduce the cartridge retention force so it may be ejected. JamIt can quickly be ejected using the bolt, lever or pump action of the rifle or shotgun.

The 7th, 8th and 9th columns of Table 1 show that JamIt along with Trois & Crawford (6,418,654), Stuart (5,394,635 & 5,347,739), Horton (5,010,674) and Giles (3,208,176) devices are quick to operate in a self defense situation, jam the gun if an unauthorized person seizes and attempts to fire the gun (pulls trigger) and once the gun is jammed, its difficult to remove the obstruction (barrel tool required). These five safety cartridges basically meet the self defense safety objectives in different ways. The Trois & Crawford device is rated as only "Fairly Quick" (column 7 of Table 1), i.e., the gun owner must pull the device from the barrel and then chamber a live round of ammunition (pistol only, not double action revolver). Also, the Removal after Activation (see column 9 of Table 1) is rated "Easy-Perhaps too easy. Child could pull out and fire a revolver." If the Trois & Crawford device was placed in the wrong gun (say a pistol with a longer barrel), then live ammunition could be chambered and an attempt to fire the pistol would cause the barrel to blow up! Horton's and Giles devices, appear to be limited to revolver use only. Most military and police officers use pistols rather than revolvers. The other two devices, JamIt and Stuart's safety cartridge, use live primers (see column 14 of Table 1) to activate the jamming function and can only be used once as shown in column 10. Both

JamIt and Stuart's cartridges are activated by firing pin impact (primer initiation) causing the handgun (revolver or pistol) to jam. Both cartridges can be readily and quickly removed or by-passed by the gun owner who is familiar with his weapon and the purpose of the safety cartridges.

There are significant differences between the Stuart safety cartridge and the JamIt safety cartridge. When the primer is initiated by the firing pin, the Stuart projectile which is longer and bigger in diameter than the JamIt slug is arrested by the gun barrel rifling becoming wedged in the barrel while still being held by the special cartridge case. The JamIt slug is connected to a standard cartridge case by an extension spring. The slug is smaller in diameter than the Stuart projectile and moves freely down the barrel after primer initiation. Slug movement is stopped after several inches of travel by the resistant force applied by the extension spring whose elastic limit is exceeded, i.e., the extension spring becomes in effect a compression spring. The resulting cartridge is typically 5 inches long (for a .45 Colt Commander semiautomatic pistol) causing the slug to extend slightly beyond the gun muzzle. For most handguns, the resulting JamIt cartridge slug remains in the barrel near the muzzle end. This depends on the gun caliber and barrel length along with other factors. The fired JamIt cartridge can be removed and the pistol unjammed using a cylindrical rod inserted in the muzzle end of the barrel. This rod can be used to push the slug down the barrel. The cartridge case is then ejected through the pistol breech by pulling on the pistol slide action. Once the cartridge case is free of the chamber, it may be gripped by the pistol owner and the cartridge case, compression spring and slug is pulled out through the breech. The fired Stuart cartridge may be removed and the pistol unjammed by inserting the cylindrical rod down the barrel through the muzzle and pushing very hard to overcome the engraving force on the projectile telescoping the projectile back into the special cartridge case and then ejecting the cartridge assembly through the pistol breech by pulling on the pistol slide action. A similar action on the part of the gun owner is required to unjam a revolver rather than pistol, i.e., the rod is used to push against the JamIt slug (or Stuart projectile) telescoping the slug (projectile) back into the cartridge case until the tip of the slug (projectile) aligns with the forward surface of the cylinder allowing the cylinder chamber containing JamIt (or Stuart safety cartridge) to be moved out of line with the barrel and removed causing the revolver to be unjammed.

In Stuart's most recent patent (5,394,635) for automatic Colt pistols, the long projectile is propelled into and wedged in the barrel by the resultant primer and gun powder gases when initiated by an unauthorized person pulling the trigger. The short cartridge case may be ejected by the unauthorized person by pulling on the slide action leaving the projectile stuck in the barrel. The wedged projectile prevents further live ammunition from being chambered causing the Colt pistol to be jammed. A safety problem could occur if the projectile is propelled too far down the barrel allowing a live round to be chambered and fired with the obstruction (projectile) in the barrel. This can never happen with the JamIt safety cartridge where the slug is firmly connected to the cartridge case with the compression (extension) spring.

The JamIt cartridge is more producible and uses standard rather than special cartridge cases and a much simpler projectile (slug). A simple extension spring anchors the projectile (slug) to the cartridge case using a standard 0.0625 inch spring steel roll pin which is pressed into the side of the cartridge case. The JamIt cartridge is simpler, lower in cost, more reliable and safer than the Stuart safety cartridge. The force relationships for deformation of an extension spring into a compression spring is a much more repeatable event than the force relationships involved in deformation of an oversized projectile in a rifled barrel. Projectile final position in the barrel is dependent on exact projectile diameter, barrel inside diameter and rifling dimensioning, projectile material as well as primer (and gun powder if required) pressure. Early tests on concepts similar to Stuart's projectile design produced significant variability in projectile position in the barrel after primer initiation. Tests on the JamIt extension springs produced very repeatable spring deformation and therefore projectile position within the barrels of various handguns such as the .45 Colt Commander pistol, .45 Colt Gold Cup pistol, 9mm Beretta Mod. 92FS pistol, .357 Smith & Wesson double action revolver, and .357 Ruger Blackhawk single action revolver with long (6") barrel. The gun owner also has the option of installing the o-ring to the slug on the JamIt safety cartridge making it much more difficult to remove after firing it and therefore more safe .... the choice is his!

Some people may prefer to defend themselves in their home with a rifle or shotgun. JamIt can easily be adapted for use with these weapons. A small propellant charge in addition to the primer may be required for the longer extension spring. A longer spring will result in a longer cartridge assembly (maybe 10 to 20 inches long) after JamIt initiation assuring that an unauthorized person can't unjam the longer firearm by removing JamIt. The projectile press fit force may not be sufficient using the Stuart safety cartridge as indicated in footnote (1) in Table 1. The unauthorized person could generate significantly more extraction force in a bolt, lever, or pump action rifle or shotgun than in a pistol slide action. The length of the fired Stuart cartridge is limited to only about 1.5 times the unfired Stuart cartridge by the basic concept design.

## **CONCLUSIONS**

More than 850 patents were reviewed in the JamIt patent search. Most of these patents were not related to JamIt. Most involved lock boxes, display rack locks, trigger locks, etc. Fourteen (14) of the patents which were similar to JamIt are identified along with JamIt in Table 1. These patents along with the JamIt provisional patent are also attached. JamIt can be used to provide loaded gun safety against unauthorized use by children or criminals along with quick action by the gun owner for self defense. It can be used on all loaded pistols, revolvers, rifles and shotguns. Unauthorized use of any of these loaded weapons equipped with JamIt results in a jammed gun. Removal of the fired JamIt cartridge is difficult requiring a barrel tool. Stuart's safety cartridge (5,394,635 & 5,347,739) is perhaps the most similar safety cartridge to JamIt as shown in Table 1. These are the only safety cartridges that contain live primers. There are, however, significant differences between Stuart's device and JamIt; namely:

- JamIt can be used to provide safety to pistols, revolvers, rifles and shotguns.
- JamIt contains an extension spring which is transformed into a very long compression spring when initiated.
- JamIt's slug (projectile) moves freely in the gun barrel and is not a press fit like the Stuart device.
- The gun owner is given the option of installing an o-ring to the JamIt slug which provides for a press fit of the slug in the barrel making it much more difficult to remove if the JamIt is fired by a child playing with the owners gun, i.e., the o-ring provides more safety and would probably require a gunsmith to remove the fired JamIt Safety Cartridge!
- JamIt uses more low cost standard and common components and is more producible.
- The fired JamIt cartridge length can be increased to 5", 10", 20", or longer to assure rifle or shotgun jamming action. The fired length of the Stuart cartridge is limited to about 1.5 times the length of the unfired cartridge.
- JamIt is easily identified by the gun owner as a safety cartridge with its red anodized aluminum or white plastic (Delrin) slug and bent spring nose, i.e., the JamIt cartridge is "flagged" for identification but the Stuart cartridge is not.
- No dangerous barrel obstructions are possible with JamIt.

jamit45

# TABLE 1 - How JamIt Safety Cartridge Differs from other Inventions Identified in the Patent Search

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Patent No.	Description Safety cartridge (JamIt)	Date Issued 2003?	Inventor(s) Aske	Loaded Pistol & Revolver Both	Loaded Rifle & Shotgun Both	Owner use of gun for Self Defense Quick-Eject cart. (pistol) or rotate cylinder (revolver)	Unauthorized use of gun Pulling trigger jams gun	Removal after Activation Difficult-Barrel tool required + Eject cart. Owner can make it more difficult (safe) by adding o-ring to the Slug. Easy-Perhaps too easy. Child could pull out and fire a revolver. Difficult-Barrel Tool required + Must eject Breech Member Difficult-Barrel tool required + Eject cart. Difficult-Barrel tool required + Eject cart.	Use after Activation? No	Flag? Yes	Press Fit No	Spring? Extension becoming compression	Primer? Yes
6,418,654	Handgun safety device	7/2002	Trois & Crawford	Both	No	Fairly Quick-Must pull device from barrel and chamber live round Slow-Barrel Tool required to remove	Chamber and barrel plugged-can't be fired	Difficult-Barrel tool required + Eject cart.	Reusable	Yes	No	Optional	No
6,408,556	Breech block firearm safety device	6/2002	Achee & Zaharek	Both	No	Slow-Barrel Tool required to remove	Chamber plugged- can't be fired	Difficult-Barrel Tool required + Must eject	Reusable	No	No	No	No
6,237,272	Breech block safety	5/2001	Scott	Pistol only	Slow	Slow-Barrel tool required to remove	Chamber plugged- can't be fired	Breech Member Difficult-Barrel tool required + Eject cart.	Reusable	No	Yes	No	No
6,041,536	Security lock for revolver	3/2000	Samuels	Revolver only	No	Slow-Barrel tool required to remove	Chamber plugged- can't be fired	Difficult-Barrel tool required + Eject cart.	Reusable	No	No	No	No
5,950,344	Quick-release gun lock	9/1999	Ross	Pistol only	Slow	Slow-Barrel tool required + Eject	Chamber plugged- can't be fired	Difficult-Barrel tool required + Eject cart.	Reusable	No	Yes	No	No
5,475,994	High security gun lock	12/1995	Briley, Croft, & Schneck Stuart	Both	No	Slow-Barrel tool must be removed + Eject	Chamber plugged- can't be fired	Difficult-Barrel tool must be removed + Eject cart.	Reusable	Yes	No	No	No
5,394,635	Safety cartridge	3/1995		Both	? (1)	Quick-Eject cart. (pistol) or rotate cylinder (revolver)	Pulling trigger jams gun	Difficult-Barrel tool required + Eject cart.	No	No	Yes	No	Yes
5,347,739	Safety cartridge	9/1994	Stuart	Both	? (1)	Quick-Eject cart. (pistol) or rotate cylinder (revolver)	Pulling trigger jams gun	Difficult-Barrel tool required + Eject cart.	No	No	Yes	No	Yes
5,171,924	Flagged firearm lock	12/1992	Honey, Osborne, & Ruston	Better for revolvers	No	Slow-Barrel tool required	Chamber plugged- can't be fired	Difficult-Barrel tool required	Reusable	Yes	No	No	No
5,052,142	Safety lock for revolvers	10/1991	Mikus	Revolver only	No	Slow-Barrel tool required	Revolver cylinder locked-can't be fired	Difficult-Barrel tool required + Eject cart.	Reusable	No	No	Compression	No
5,010,674	Spring actuated safety cartridge	4/1991	Horton	Better for Revolver	? (2)	Quick-Eject cart. (pistol) or rotate cylinder (revolver)	Pulling trigger jams gun	Difficult-Barrel tool required + Eject cart.	Reusable	No	No	Ribbon like Compression	No
4,783,924	Handgun safety device	11/1988	Thurber	Both	No	Slow-40 pound force + Remove cart.	Chamber & barrel plugged-can't be fired	Difficult-Remove lock and chamber plug	Reusable	Yes	No	No	No
3,208,176	Safety device for guns	9/1965	Giles	Better for revolvers	No	Quick-Rotate cylinder (revolver)	Pulling trigger jams revolver	Difficult-Barrel tool required + Eject cart.	Reusable	No	No	Compression	No
37,946	Implement for disabling ordnance	3/1863	Bonzano	No-For muzzle loaded cannon		Not applicable	Chamber plugged- load thru muzzle	Difficult-Barrel tool required	Reusable	No	No	No	No

- (1) Projectile (slug) press fit force may not be sufficient to prevent user from loading new round of live ammunition.  
(2) Unwound spring may be of insufficient length to prevent user from cycling in new round of live ammunition.

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## USPTO PATENT FULL-TEXT AND IMAGE DATABASE

<a href="#">Home</a>	<a href="#">Quick</a>	<a href="#">Advanced</a>	<a href="#">Pat Num</a>	<a href="#">Help</a>
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Searching 1790 to present...

Results of Search in 1790 to present db for:

(((((PN/37946 OR PN/3208176) OR PN/4783924) OR PN/5010674) OR PN/5052142) OR PN/5171924) OR PN/5347739) OR PN/5394635) OR PN/5475994) OR PN/5950344) OR PN/6041536) OR PN/6237272) OR PN/6408556) OR PN/6418654): 14 patents.

Hits 1 through 14 out of 14

Warning: Patents from 1790 through 1975 were searched using only Patent Number and/or Current US Classification!

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Refine Search	PN/37946 OR PN/3208176 OR PN/4783924 OR PN
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PAT. NO.	Title
1 <u>6,418,654</u>	<b>T</b> <u>Handgun safety device</u>
2 <u>6,408,556</u>	<b>T</b> <u>Breech block firearm safety device</u>
3 <u>6,237,272</u>	<b>T</b> <u>Breech block safety device</u>
4 <u>6,041,536</u>	<b>T</b> <u>Security lock for revolver type handguns</u>
5 <u>5,950,344</u>	<b>T</b> <u>Quick-release gun lock</u>
6 <u>5,475,994</u>	<b>T</b> <u>High security gun lock device</u>
7 <u>5,394,635</u>	<b>T</b> <u>Safety cartridge</u>
8 <u>5,347,739</u>	<b>T</b> <u>Safety cartridge</u>
9 <u>5,171,924</u>	<b>T</b> <u>Flagged firearm lock method and apparatus</u>
10 <u>5,052,142</u>	<b>T</b> <u>Safety lock for revolvers</u>
11 <u>5,010,674</u>	<b>T</b> <u>Spring actuated safety cartridge</u>
12 <u>4,783,924</u>	<b>T</b> <u>Handgun safety device</u>
13 <u>3,208,176</u>	■ 42/66 42/70.11
14 <u>37,946</u>	■ 89/1.1 42/70.11 126/19R

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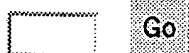
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▲ Full Text  
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Go to Page:



**Sections:**

- Front Page
- Drawings
- Specifications
- Claims
- Correction

Patent Number: 06418654

Section: Front Page 1 of 11 pages

[Help](#)



US006418654B1

(12) **United States Patent**  
Trois et al.

(10) Patent No.: **US 6,418,654 B1**  
(45) Date of Patent: **Jul. 16, 2002**

(54) **HANDGUN SAFETY DEVICE**

(76) Inventors: **Charles J Trois**, 15601 R.R. 965,  
Fredericksburg, TX (US) 78624; **Buel**  
**Y. Crawford**, 9107 Vinewood, Dallas,  
TX (US) 75228

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/422,896

(22) Filed: **Oct. 22, 1999**

**Related U.S. Application Data**

(60) Provisional application No. 60/105,270, filed on Oct. 22,  
1998, now abandoned.

(51) Int. Cl.<sup>7</sup> ..... **F41A 17/44**

(52) U.S. Cl. .... **42/70.11; 42/66**

(58) Field of Search ..... **42/70.01, 70.11,**  
**42/66**

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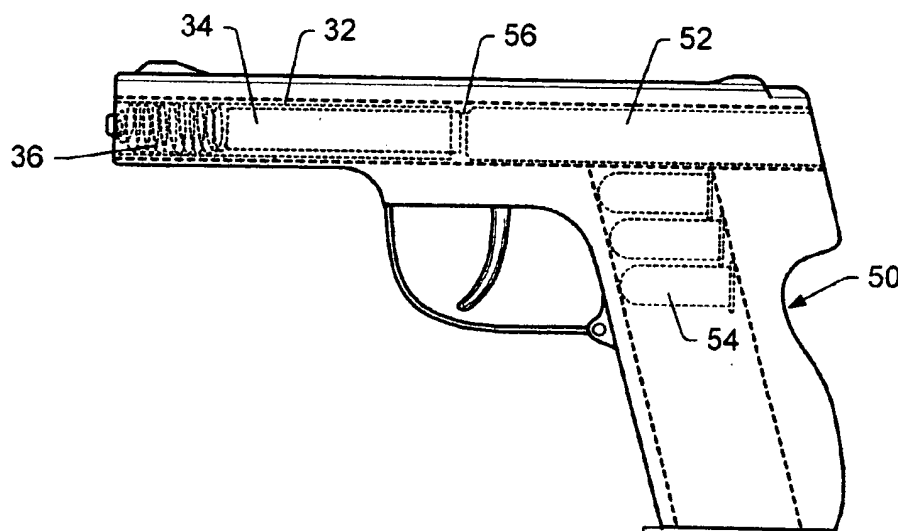
*Primary Examiner*—Stephen M. Johnson

(74) *Attorney, Agent, or Firm*—Eric B. Meyertons; Conley,  
Rose & Taton, P.C.

(57) **ABSTRACT**

Handgun safety devices may prevent the loading of ammunition into a handgun. The safety devices may be inserted into a barrel of a handgun. The safety devices may extend into a firing chamber of the handgun to prevent a bullet from entering the chamber, or to prevent cylinder from rotating in a revolver. An end of the safety device may be configured to resemble the end of the barrel of the handgun. The safety devices may prevent a child, or someone unfamiliar with a handgun, from accidentally loading and discharging a gun. The safety devices may also allow a user of the gun who is familiar with the safety devices the ability to quickly remove the safety device and use the gun.

**4 Claims, 6 Drawing Sheets**



Patent Number: 06418654

Section: Drawings 2 of 11 pages

[Help](#)

U.S. Patent

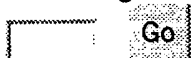
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Sheet 1 of 6

US 6,418,654 B1

▲ [Full Text](#)  
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Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

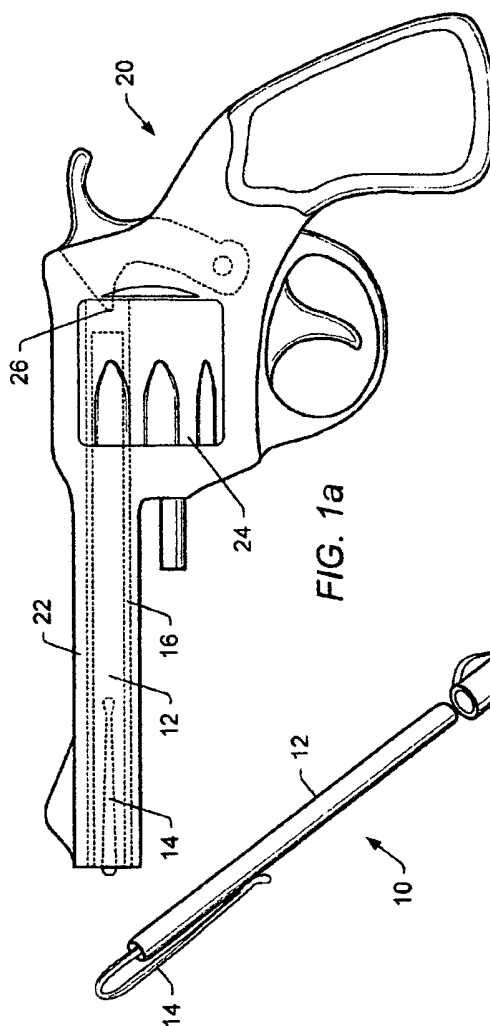


FIG. 1a

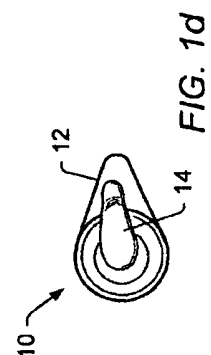


FIG. 1d

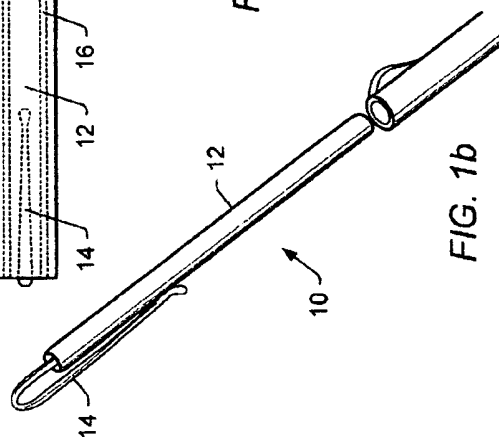


FIG. 1b

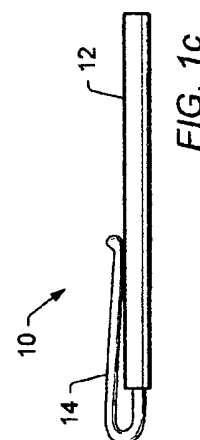


FIG. 1c

Patent Number: 06418654

Section: Drawings 3 of 11 pages

[Help](#)

U.S. Patent

Jul. 16, 2002

Sheet 2 of 6

US 6,418,654 B1

▲ Full Text  
? Help

Go to Page:

Go



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

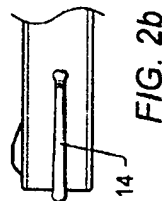


FIG. 2b

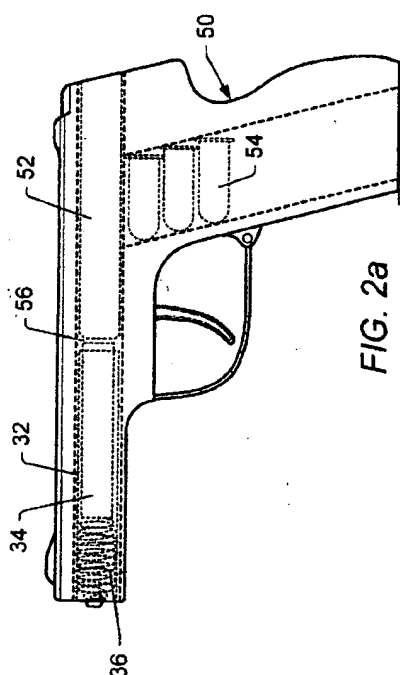


FIG. 2a

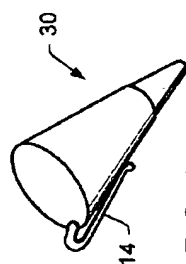


FIG. 2c

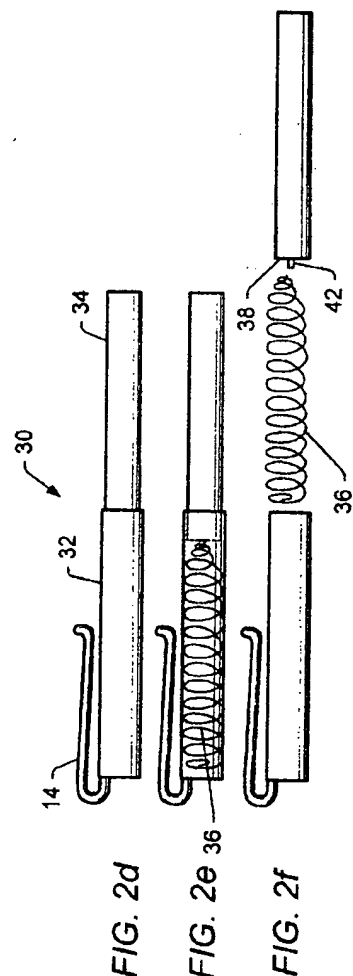


FIG. 2d

FIG. 2e

FIG. 2f

Patent Number: 06418654

Section: Drawings 4 of 11 pages

[Help](#)

U.S. Patent

Jul. 16, 2002

Sheet 3 of 6

US 6,418,654 B1

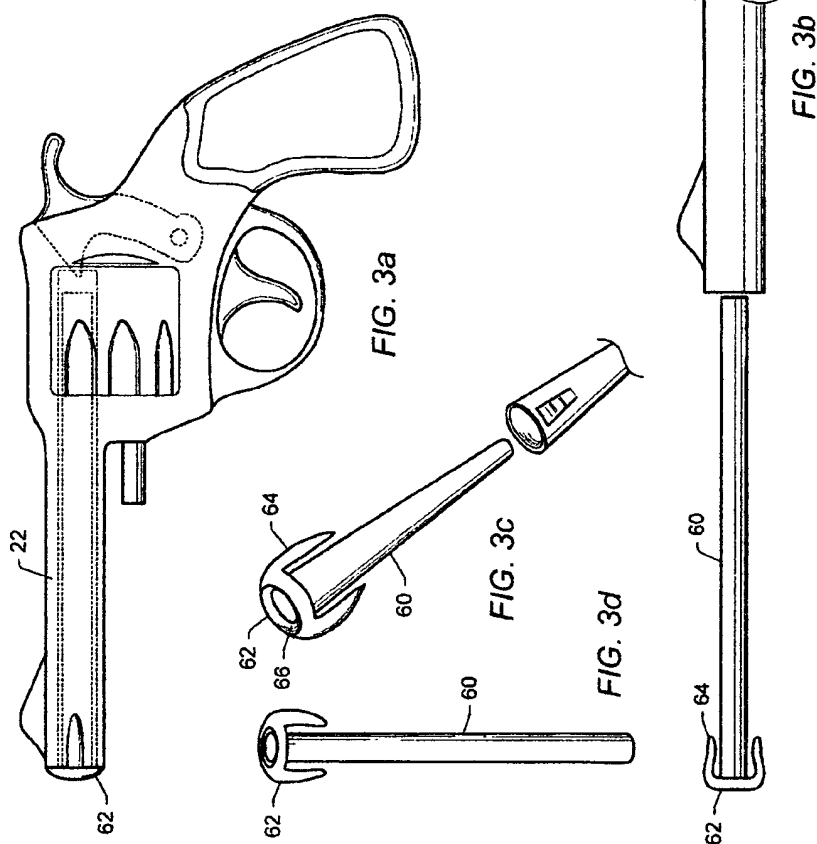
[Full Text](#)[Help](#)

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)



Patent Number: 06418654

Section: Drawings 5 of 11 pages

[Help](#)



U.S. Patent

Jul. 16, 2002

Sheet 4 of 6

US 6,418,654 B1

▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

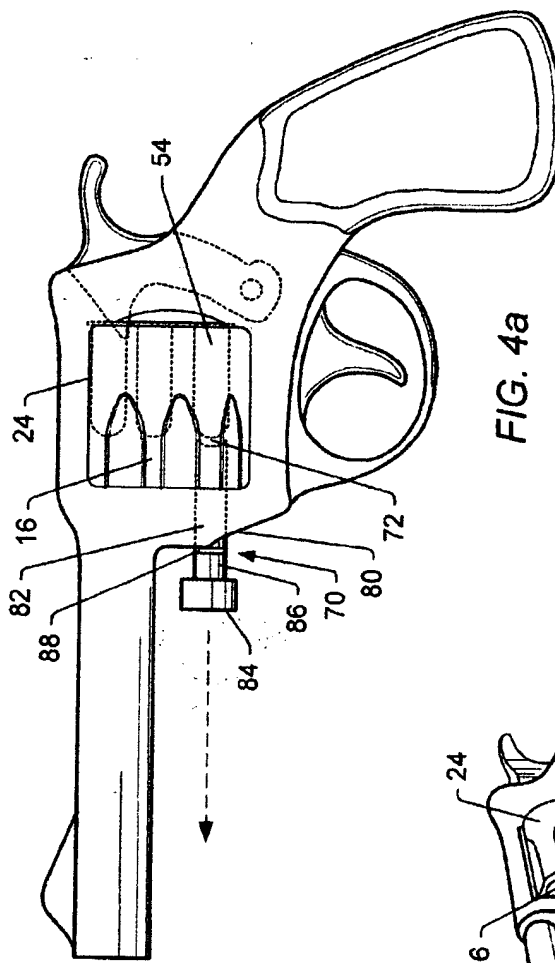


FIG. 4a

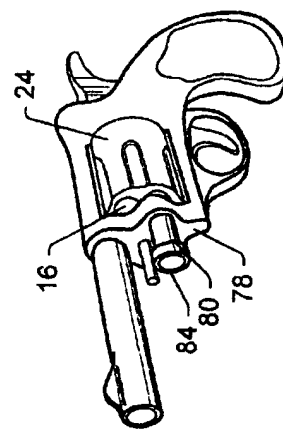


FIG. 4b

Patent Number: 06418654

Section: Drawings 6 of 11 pages

[Help](#)

U.S. Patent

Jul. 16, 2002

Sheet 5 of 6

US 6,418,654 B1

[Full Text](#)[Help](#)

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

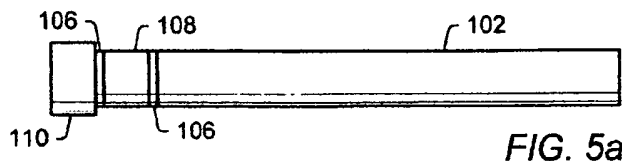


FIG. 5a

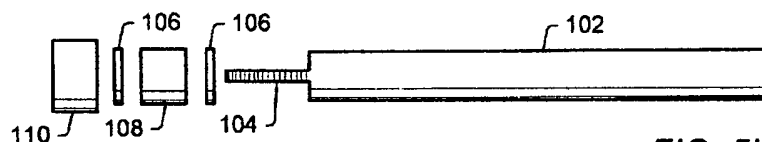


FIG. 5b

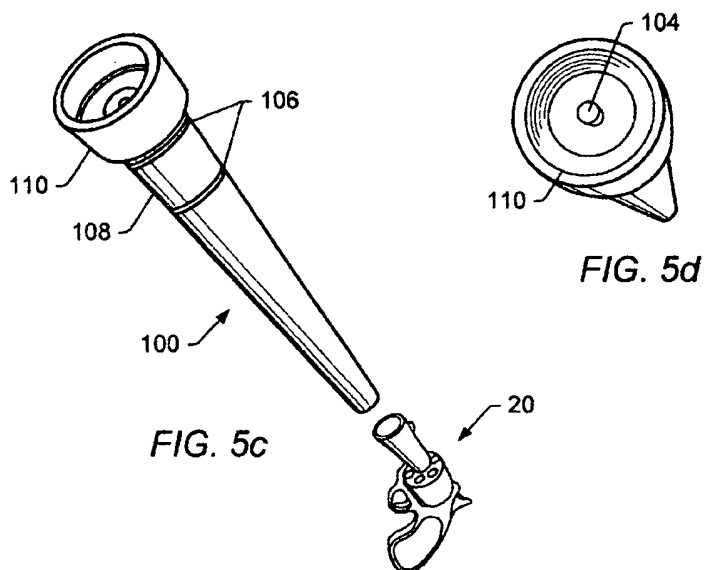


FIG. 5c

FIG. 5d

Patent Number: 06418654

Section: Drawings 7 of 11 pages

[Help](#)

U.S. Patent

Jul. 16, 2002

Sheet 6 of 6

US 6,418,654 B1

[Full Text](#)  
[Help](#)

Go to Page:

Go



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

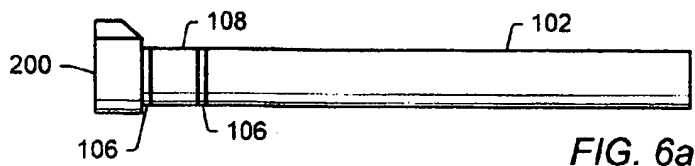


FIG. 6a

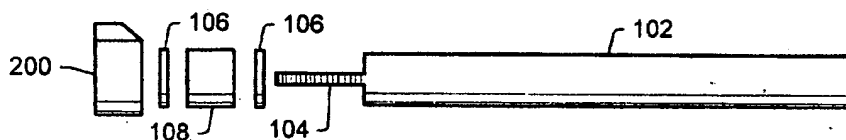


FIG. 6b

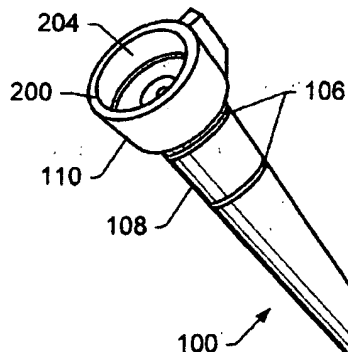


FIG. 6c

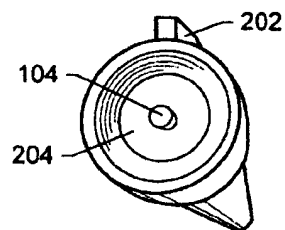


FIG. 6d



▲ Full Text  
? Help

Go to Page:

 Go


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

Patent Number: 06418654

Section: Specifications

8 of 11 pages

[Help](#)

US 6,418,654 B1

## 1 HANDGUN SAFETY DEVICE

Priority is claimed with regard to U.S. Provisional Application No. 60/105,270, filed on Oct. 22, 1998, and now abandoned.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention is related to the field of firearms and firearm safety devices, particularly handgun safety devices.

#### 2. Description of the Relevant Art

The most widely used gun locks are designed as two piece devices that snap together over a trigger guard and prevent access to the trigger. These devices typically use a pin and tumbler mechanism and are opened by a key. A drawback to this type of lock is the time required to find a key, unlock the guard and then possibly load the gun. In an emergency situation there may not be enough time to perform all these steps.

Another type of lock is exemplified by the SPEED RELEASE GUN LOCK™, which is a trigger guard lock that does not require a key. This device utilizes an electronic lock, and an activation button that lights a touchpad for a digital security code that unlocks the device. Again, in an emergency situation, it may not be desirable to have to turn on a lighted keypad and remember a security code.

### SUMMARY OF THE INVENTION

The problems outlined above may in large part be solved by a safety device that resides within a barrel of a handgun during use. The safety devices described herein are inexpensive and simple to operate. The safety devices may be removed quietly and instantly in total darkness and without a key. The safety devices described herein are able to prevent a child or someone unfamiliar with a handgun from accidentally firing the gun, but allow the owner of the gun to quickly remove the safety device, if needed.

A safety device may be designed to slide into a barrel of a handgun and into a chamber. During use, the device projects into the chamber aligned with the barrel and either prevents the cylinder from rotating in a revolver, or the device prevents a bullet from entering the chamber in a semi-automatic handgun. In certain embodiments, the device may be designed so that a rod may slide directly into a chamber of a revolver and prevent the cylinder from rotating. For example, a casing for the device may be attached to the face of a gun so that the interior of the casing aligns with a chamber in the cylinder. A rod in the casing may then be projected into that cylinder, either when the chamber is empty or when the chamber contains a bullet, as long as the rod projects far enough into the chamber to inhibit rotation of the cylinder. As described below, the rod may be configured to conform to the nose of a bullet so that the rod may more easily project into a chamber that contains a bullet during use.

Alternative embodiments of safety devices may be designed with two pieces and a force applying member (spring) positioned between the two members. During use, the device is placed in the barrel of a pistol and a smaller diameter piece is held at least partially inside a larger diameter piece. When used in a revolver, the smaller diameter piece is pushed into the chamber and prevents rotation of the cylinder. This type of device is effective when the chamber is empty, and is also effective when a bullet is present in the chamber. In either case, as long as the rod or

2  
tube projects into the chamber, rotation of the cylinder is prevented and the gun is disarmed. In certain embodiments, an end of the rod may be spring loaded to allow the device to fit within the barrel of a gun when a round of ammunition is loaded in the gun. A spring-loaded device is also effective for use in a semi-automatic handgun. When the semi-automatic is cocked by moving the extractor out of the chamber in order to move a bullet into the chamber, the spring pushes the smaller piece of the safety device into the chamber as the extractor is withdrawn, thus preventing a bullet from entering the chamber.

To disarm a gun, a user may place a safety device within the barrel of the gun. The safety device may be secured to the barrel of the gun by a mechanism which may be, but is not limited to, a spring clip, a cap, and an expansion gasket which forms a friction fit with the barrel. To return the gun to a usable condition, the user may remove the safety device from the gun barrel. After removal of the safety device from the barrel of the gun, the gun may be cocked and/or fired.

In an embodiment, the end of the safety device may be configured to resemble the end of a barrel of a gun. The end of the safety device that resembles the end of the barrel may include a structure that resembles the sight of the handgun. Also, the end of the safety device that resembles the end of the barrel may include a bore that resembles the barrel of the gun. When a safety device which resembles the end of a barrel of a gun is installed in the barrel of the gun, a person who is unaware of the nature of the safety device may believe that the gun is in a usable condition, even though the gun is actually disarmed. This may be advantageous if an unauthorized person has possession of the gun. The person who disarmed the gun will know that the gun remains disarmed. Also, having a gun that appears to be in a usable condition even though the gun is disarmed may be advantageous because a child who picks up the gun will not know that the gun is disarmed, and the child will not know to remove the safety device. Having a gun that appears to be in a usable condition even though the gun is disarmed may be advantageous where the authorized user of the gun does not have sufficient time in an emergency situation to remove the safety device. The gun would still have the appearance of a gun that could be fired.

### BRIEF DESCRIPTION OF THE DRAWINGS

The following drawings form part of the present specification and are included to further demonstrate certain aspects of the present invention. The invention may be better understood by reference to one or more of these drawings in combination with the detailed description of specific embodiments presented herein.

FIG. 1 depicts an embodiment with a single rod or tube.

FIG. 2 depicts an embodiment comprising two pieces and a spring load.

FIG. 3 depicts an embodiment with a single rod or tube.

FIG. 4 depicts an embodiment for sliding directly into a chamber of a revolver.

FIG. 5 depicts an embodiment securable by a nut.

FIG. 6 depicts an embodiment wherein an end of the safety device resembles the end of a barrel of a gun.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof are shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that the drawings and detailed description thereto are not intended to limit the invention to the particular form



Patent Number: 06418654

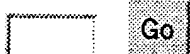
Section: Specifications

9 of 11 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:



## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

US 6,418,654 B1

3

disclosed, but to the contrary, the intention is to cover all modifications, equivalents and alternatives falling within the spirit and scope of the present invention as defined by the claims.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows an embodiment of a gun safety device 10 that may be used with a revolver 20. The device may include rod 12 and clip 14. The rod 12 may have a hollow center, or the rod may be solid. Alternately, the rod 12 may be a combination of solid portions and hollow portions. The rod 12, or the casings and rods described below may be made of rubber, a plastic, a polymer, a ceramic, wood, a metal such as stainless steel, aluminum, brass, etc. or any other suitable material, or combination of materials. The devices may be supplied with a twelve inch tube or rod 12, which may then be cut to fit a particular gun, or the devices may be supplied in a range of lengths, from about two inches up to about fourteen inches or more as necessary. The tubes 12 may also be provided in a variety of calibers, such as 20 caliber, 30 caliber, 40 caliber, 50 caliber and increments between those that would include, but is not limited to 22 caliber, 38 caliber, 44 caliber, etc. In certain embodiments, the devices may be manufactured to be compatible with a particular brand and caliber of firearm, and in other embodiments they may be more generically designed. Any of the devices described herein may be colored to match the finish of a handgun, either blued steel or stainless, for example. The tubes or rods 12 may also be provided in a variety of shapes in order to be compatible with particular gun barrels. For example, they may be provided as round, rifled, flat, octagonal, square, fluted or other configurations as appropriate.

A spring clip 14 is also shown in FIG. 1. Any of the devices described herein may have one or more spring clips 14 as described herein. The spring clip 14 is a spring that is biased toward the tube 12 so that when the device is inserted into a barrel, the spring clip 14 presses against the barrel and holds the device in place. Spring clips may be made of plastic or metal, such as aluminum, brass, etc and may be of the same color as the tube 12 or they may be of a different color.

A device 10 is shown in place in a revolver 20. The device is inserted in the barrel 22 of the revolver 20 and extends into a chamber 16 of the cylinder 24. When the device 10 is in this position, the cylinder 24 is prevented from rotating to move a bullet in position to be struck by the firing pin 26, and the gun is thus disarmed. When this embodiment is used with a semi-automatic handgun, the rod is configured to project into the chamber, and when an attempt is made to cock the handgun, the bullet jams against the rod and does not properly enter the chamber.

An embodiment of a safety clip is shown in use with a semi-automatic handgun in FIG. 2. The safety device 30 may include an outer casing 32, and a smaller tube 34 that is configured to fit at least partially inside the outer casing 32 during use. The device 30 may also include a spring 36, held inside the outer casing 32 and configured to push the smaller tube 34 out of the outer casing 32 during use. The smaller tube 34 may also include a connector 38 configured to engage the spring 36. The connector 38 may include a pin 42 configured to be hooked to the end of the spring 36. A spring clip 14 is shown that may be of the same construction as the previously described spring clip.

When this embodiment of the invention is in place as shown in FIG. 2, the smaller tube 34 may be almost completely contained inside the outer casing 32, with the spring 36 compressed. In this position, the smaller tube 34

4

may press against the extractor 52 of the semi-automatic handgun 50. Because the spring 36 is pushing the smaller tube 34 against the extractor 52, as the extractor 52 is withdrawn upon cocking the gun, the smaller tube 34 follows the extractor 52 into the chamber 56, thus preventing a bullet 54 from entering the chamber 56. Even repeated cocking will not allow a bullet to enter the chamber 56 and the gun is disarmed. It is also understood that the embodiment described in this paragraph as being designed for use with a semi-automatic may also be used with a revolver type handgun.

An embodiment of a device 60 is shown in FIG. 3. This device works like the device shown in FIG. 1, except that the clip 62 may include two or more springs 64 that press against the outside of a barrel 22 to hold the device 60 in place. For example, the device may include 2, 3, 4, 5, 6, 7, or even 8 or more springs. In certain embodiments, the device may include a continuous deformable ring that snaps onto the barrel to hold the device in place during use. In certain embodiments the device 60 may also include an end 66 that fits over the end of a barrel 22. The end 66 may mimic the end of the barrel 22, including possibly providing an opening into the barrel 22 so that the presence of the device 62 is not immediately obvious to an observer. Although the embodiment shown is designed to fit on a substantially round barrel 22, a clip 62 may be configured to cover any type of barrel known in the art, including barrels of semi-automatic weapons. As such, the clip 62 shown in FIG. 3 may also be used a device such as device 30 shown in FIG. 2.

An embodiment of a device 70 is shown in FIG. 4. The device 70 is configured to be inserted directly into a chamber 16 of a revolver. Insertion of device 70 prevents the cylinder 24 from rotating when an attempt is made to pull the trigger. The device 70, includes an end 72 that may rest against a bullet 54 held in a chamber 16, or the end 72 may enter the chamber 16 and not reach as far as the nose of a bullet 54 if present. In this embodiment, the device 70 may include an outer casing 80 built into or permanently attached to the face 78 of the gun and an inner tube or rod 82 that slides within the outer casing 80. The inner rod 82 may also include a nut 84 and a deformable washer 86 disposed between two metal washers 88. The device may also include a threaded projection (not shown) attached to inner rod 82 and configured to pass through washers 86 and 88 to mate with nut 84. When the nut 84 is tightened onto the projection, the deformable washer 86 is squeezed out against the inside of the casing 80 to hold the device in place.

A device 100, shown in FIG. 5 may be used in a revolver 20, or it may be adapted to be used in a device for a semi-automatic handgun. The device 100 includes a tube or rod 102 to be inserted in a barrel. Although the device 100 is described as used in a revolver, it is understood that the device 100 is easily adapted to semi-automatic, in which the tube 102 would be replaced with an outer casing to hold a smaller diameter tube and spring. The device 100 may include a threaded projection 104 attached to the tube 102. The device may also include a deformable member, such as a rubber washer 108 disposed between two non-deformable washers 106 that are preferably constructed of metal. The device 100 may also include a nut 110 threadable on the projection 104. The washers 106 and 108 provide openings therein to be slidable onto the projection 104. During use, when the device is inserted into a barrel, the nut may be tightened until the deformable washer 108 becomes squeezed between the non-deformable washers 106 and is thus squeezed out against the inside of the barrel, thus holding the device 100 in place. In certain embodiments, the threaded nut may also be disposed directly against the deformable washer 108 in lieu of a second washer.

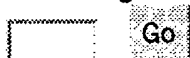
Patent Number: 06418654

Section: Claims 10 of 11 pages

[Help](#)

▲ **Full Text**  
 ? **Help**

Go to Page:

**Sections:**

- **Front Page**
- **Drawings**
- **Specifications**
- **Claims**
- **Correction**

US 6,418,654 B1

5

FIG. 6 shows an embodiment of a device 10 wherein end 200 of the device is configured to resemble the end of a barrel 22 of a gun. The end 200 of the device 10 may include a sight 202 and a bore 204. The sight 202 and the bore 204 of the end 200 give the device the appearance of a gun barrel when the device is installed in a gun and a viewer looks at the gun straight into the barrel. The gun may appear to be functional when the device 10 is installed in the gun, even though the gun is actually disarmed.

Further modifications and alternative embodiments of various aspects of the invention will be apparent to those skilled in the art in view of this description. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the general manner of carrying out the invention. It is to be understood that the forms of the invention shown and described herein are to be taken as the presently preferred embodiments. Elements and materials may be substituted for those illustrated and described herein, parts and processes may be reversed, and certain features of the invention may be utilized independently, all as would be apparent to one skilled in the art after having the benefit of this description of the invention. Changes may be made in the elements described herein without departing from the spirit and scope of the invention as described in the following claims.

What is claimed is:

1. A handgun safety system, comprising:

a handgun;

a casing, wherein at least a portion of the casing is positionable in a barrel of the handgun;

6

a mount coupled to the casing, the mount configured to couple the casing to the barrel near an exit end of the barrel;

an elongated member configured to be at least partially contained in the casing, wherein the elongated member is insertable into the barrel so that the elongated member extends into a firing chamber of the handgun;

a force applying member coupled to the casing and the elongated member, wherein the force applying member extends the elongated member to an initial position relative to the casing; and

wherein the elongated member partially retracts within the casing when the mount is coupled to the barrel and force is applied to an end of the elongated member, and wherein wherein the elongated member prevents a round of ammunition from being positioned in a firing chamber of the handgun when the mount is coupled to the barrel and the elongated member is positioned in the barrel.

2. The safety system as defined in claim 1, wherein the mount comprises a clip.

3. The safety system as defined in claim 1, wherein the handgun comprises a semi-automatic handgun.

4. The safety system as defined in claim 1, wherein the mount is configured to resemble an end of a gun barrel.

\* \* \* \* \*

Patent Number: 06418654

Section: Correction 11 of 11 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)
- [Correction](#)

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,418,654 B1  
DATED : July 16, 2002  
INVENTOR(S) : Trois et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 6.

Line 18, please delete "wherein wherein" and substitute therefor -- wherein --.

Signed and Sealed this

Eighteenth Day of February, 2003

JAMES E. ROGAN  
*Director of the United States Patent and Trademark Office*

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▲ Full Text  
? Help

Go to Page:


**Sections:**

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 06408556

Section: Front Page 1 of 6 pages

[Help](#)



US006408556B1

(12) **United States Patent**  
Achee et al.

(10) Patent No.: **US 6,408,556 B1**  
(45) Date of Patent: **Jun. 25, 2002**

(54) **BREECH BLOCK FIREARM SAFETY DEVICE**

(76) Inventors: **John D. Achee**, 134 Belmont Dr.;  
**Richard L. Zaharek**, 105 Highfield Dr., both of Torrington, CT (US) 06790

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/931,426

(22) Filed: Aug. 16, 2001

(51) Int. Cl. F41A 17/00

(52) U.S. Cl. 42/70.11

(58) Field of Search 42/70.11, 90

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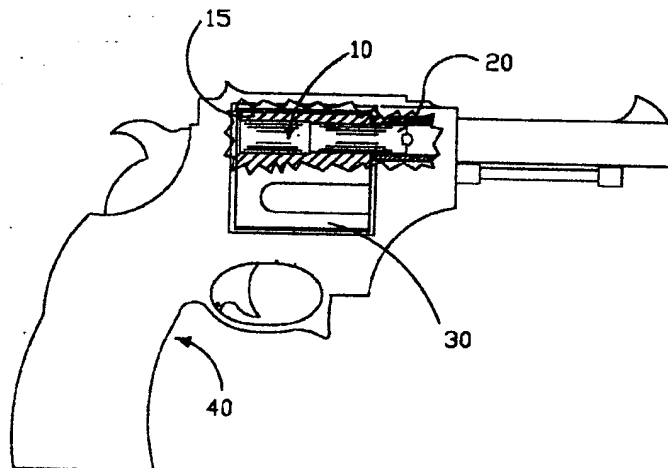
Primary Examiner—David M. Mitchell

Assistant Examiner—Denise J Buckley

(57) **ABSTRACT**

A breech block firearm safety device for the prevention of injury to children having unauthorized access to loaded firearms. This device will also protect gun owners from injury due to mishandling or the dropping of a loaded weapon. The safety device utilizes a two piece blocking assembly having a breech member and a bore member. The breech member is inserted into the breech just as you would insert a live round to arm a weapon. The bore member is inserted into the muzzle of the firearm and screw connected to the breech member using special tooling. The chamber blocking assembly can be easily extracted but the overall length is such that the end of the bore member remains in the breech making ejection impossible. The assembly can only be returned to the breech, making manual or automatic loading of live ammunition impossible. When the above safety device is installed in a revolver the overall length prevents the rotation of the cylinder and prevents the loading of live ammunition into firing position.

4 Claims, 3 Drawing Sheets



Patent Number: 06408556

Section: Drawings 2 of 6 pages

[Help](#)

U.S. Patent

Jun. 25, 2002

Sheet 1 of 3

US 6,408,556 B1

[Full Text](#)[Help](#)

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

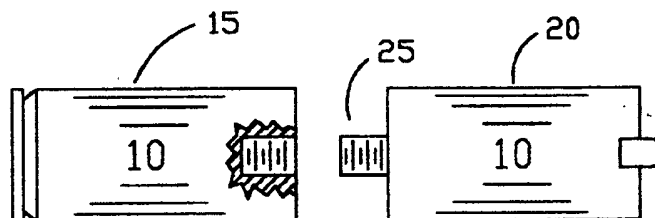


FIG 1

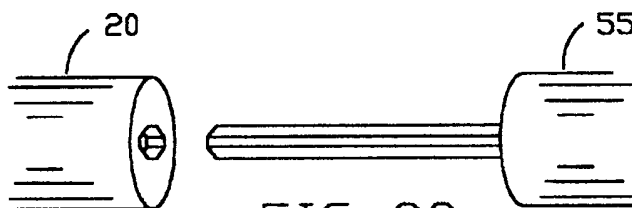


FIG 3C

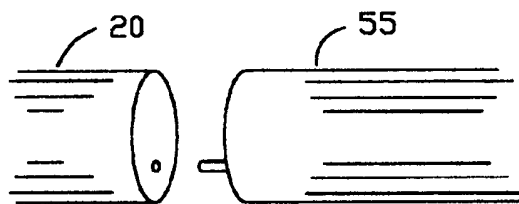


FIG 3B

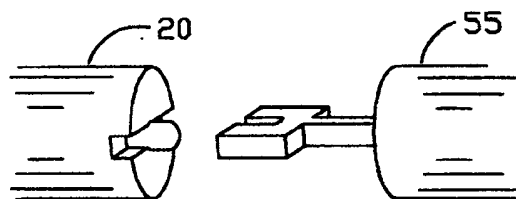


FIG 3A



## U.S. Patent

**Jun. 25, 2002**

**Sheet 2 of 3**

US 6,408,556 B1

 **Full Text**  
 **Help**

**Go to Page:**

**Go**



### Sections:

- Front Page
- Drawings
- Specifications
- Claims

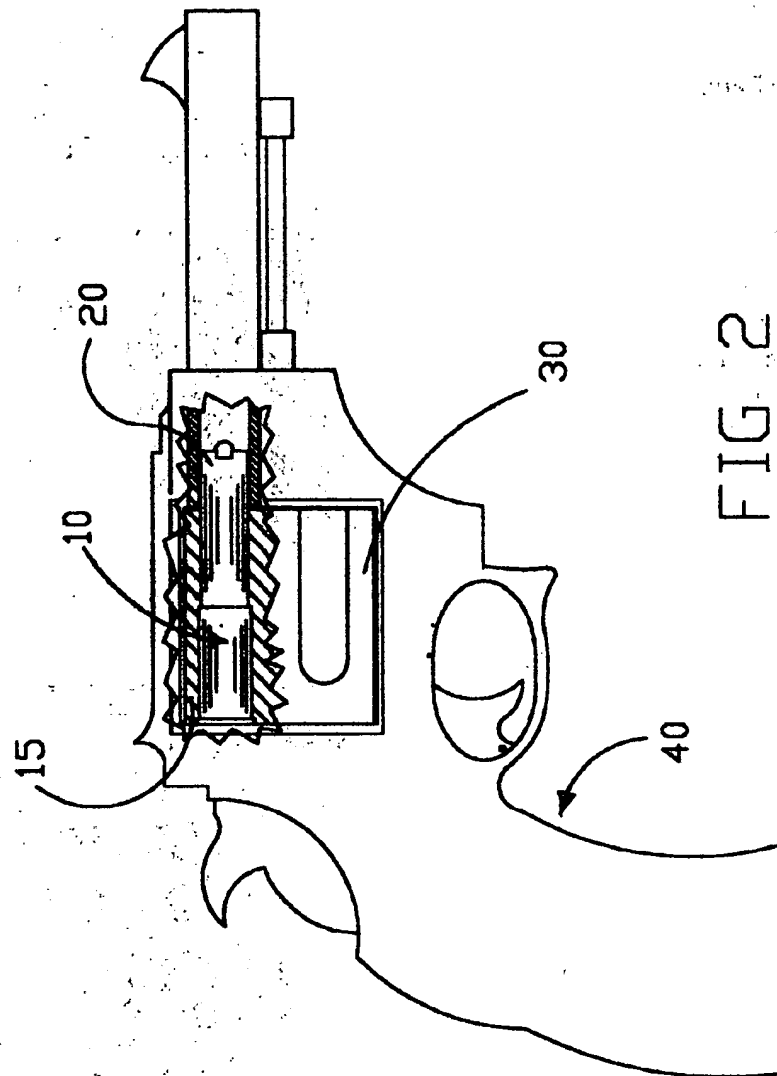


FIG 2

Patent Number: 06408556

Section: Drawings 4 of 6 pages

[Help](#)



U.S. Patent

Jun. 25, 2002 Sheet 3 of 3

US 6,408,556 B1

[Full Text](#)  
[Help](#)

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

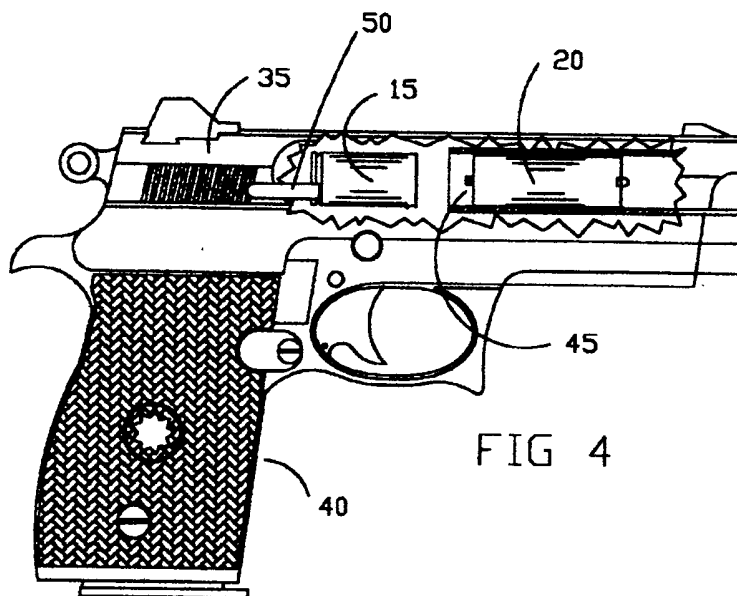


FIG 4

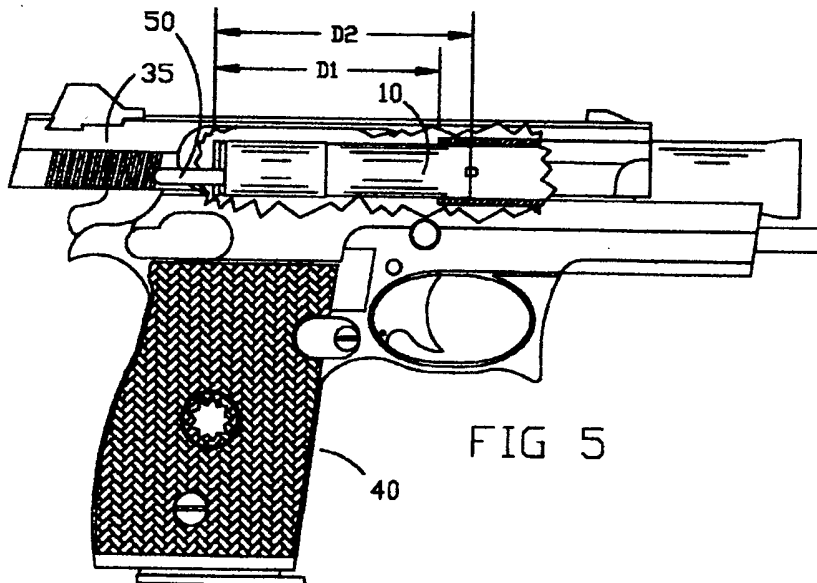


FIG 5





▲ Full Text  
? Help

Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Patent Number: 06408556

Section: Specifications 5 of 6 pages

[Help](#)

US 6,408,556 B1

1

## BREECH BLOCK FIREARM SAFETY DEVICE

### BACKGROUND—FIELD OF INVENTION

This invention relates to firearm safety devices, specifically to firing chamber blocking devices.

### BACKGROUND—DESCRIPTION OF PRIOR ART

A major concern of gun owners and law enforcement officials is the fact children may gain unauthorized access to loaded guns with the consequence of someone being injured or killed. There is also concern that a gun owner may accidentally drop a loaded gun causing an unintentional discharge of the weapon.

Presently there are gun lock devices on the market that have not been entirely satisfactory. Some of these lock into the trigger guard behind the trigger thereby preventing the trigger being pulled. This device does not insure that there is not a live bullet in the firing chamber or breech allowing unintentional discharge of the firearm should it be dropped or handled improperly. There are several cable lock devices in which the breech is partially blocked or in the case of revolver the cylinder is locked out of position. In either case a live bullet can not be loaded into the breech but the firearm has to be left open allowing debris to invade the barrel, breech or the cylinder of the firearm.

ROCKY MOUNTAIN TOOL & ARMORY offers a gun lock that prevents loading live ammunition into the breech but is relatively expensive to manufacture and when used on an automatic or repeating firearm it allows live cartridges to be extracted from a loaded magazine and brought into contact with the breech blocking mechanism and causing jamming of the firearm.

Inventors have created several breech blocking gun locks to prevent the loading of live ammunition into the breech or firing chamber with lock installed. U.S. Pat. No. 5,412,959 to Bentley (1995) discloses a breech blocking that is rather expensive to manufacture and requires the use of a combination lock. When used on an automatic or repeating firearm this mechanism allows live ammunition to be extracted from a loaded magazine and be brought into forcible contact with the breech blocking mechanism causing jamming of the firearm. U.S. Pat. No. 2,479,107 (1949) to Garrison teaches a breech blocking gun lock with a locking blocking rod. This gun lock can be applied a revolver, an automatic pistol or rifle but not to a smooth bore firearm such as a shotgun. This mechanism also allows extraction of live ammunition from a magazine which can cause jamming and damage to the firearm when used on an automatic or repeating firearm.

U.S. Pat. Nos. 5,048,211 and 4,398,366 issued to Hepp and Wernicki respectively and international publication number WO 00/17596 to Hutton teach the locking of a dummy shell in the breech to prevent the entry of a live cartridge into the breech. No mention is made of deactivating the extractor or the consequences of trying to eject a dummy cartridge that is locked in place. U.S. Pat. No. 6,041,536 to Samuels teaches a breech blocking gun lock to be used on a revolver only. U.S. Pat. No. 6,237,272 B1 issued to Randy Lee Scott (2001) and U.S. Pat. No. 5,070,635 issued to David A. Cventanovich both teach chamber blocking plugs held in place by "O" rings. Both may be installed in automatic or repeating firearms but neither prevent the extraction of ammunition from a magazine. Both may be installed in a revolver but neither offer protection from the rotation of the cylinder causing live ammunition to

2

be placed in firing position unless a safety plug is inserted into each chamber of the revolver. U.S. Pat. No. 6,226,914 issued to Reed, May 8, 2001 specifies use on open port firearms thereby excluding revolvers.

### SUMMARY

In accordance with the present invention a gun safety device comprises a receiver blocking member and a bore blocking member and means to connect the two members providing an overall length approximately 20 percent longer than the ejection clearance of the firearm to be protected.

### OBJECTS AND ADVANTAGES

Several objects and advantages of the present invention are:

- (a) to provide a gun safety device that is easy to install but difficult for a child to remove without proper tooling and instructions;
- (b) to provide a gun safety device that is inexpensive to manufacture and requires no maintenance;
- (c) to provide a gun safety device that will not effect the action of the firearm or damage any part thereof;
- (d) to provide a gun safety device that is suitable for use on most firearms having an ejection mechanism with a specific ejection clearance dimension;
- (e) to provide a gun safety device that is suitable for use on revolvers;
- (f) to provide a gun safety device that can be easily removed by the insertion of a specialized tool into the muzzle of the firearm.

### DRAWING FIGURES

In the drawings closely related figures have the same number but different alphabetic suffixes

FIG. 1 shows a partially sectioned disassembled breech block safety device.

FIG. 2 shows a partially sectioned view of a revolver with an assembled breech block safety device installed preventing rotation of the cylinder.

FIGS. 3A to 3C show views of specialized tooling having different driving means for assembly and removal of the bore member of the safety device.

FIG. 4 shows a partially sectioned view of an automatic pistol with a breech member locked into the breech and a disassembled bore member in the barrel.

FIG. 5 shows a partially sectioned view of an automatic pistol with a breech block safety device extracted to the eject position with the bore member partially in the breech.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

The novel firearm safety device will now be described by reference to FIGS. 1-5. The gun safety device is generally designated numeral 10 and its primary components are breech member 15 and bore member 20. Breech member 15 has the same external configuration and dimensions as the shell portion of the ammunition to be used in gun to be protected. The breech member 15 can in fact be assembled using an unprimed shell casing filled with a soft metal such as brass or aluminum as well as a hard plastic or nylon. The axis of the breech member 15 is drilled and threaded for acceptance of connecting means 25.

Bore member 20 is a soft metal or hard plastic or nylon cylinder having a diameter approximately 0.010 of an inch



▲ **Full Text**  
 ? **Help**

Go to Page:


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

US 6,408,556 B1

3

less than the minimum diameter of the bore of the barrel to be protected and having a length that when connected to the breech member 15 produces an overall length D2 approximately 20% longer than the ejection clearance length D1. The axis of the breech end of the bore member is fitted with a threaded connecting means 25 for connection of the bore member 20 to the breech member 15 as seen in FIG. 1 FIGS. 3A to 3C show some of many possible configurations of specialized tooling for the installation and removal of the gun safety device. FIG. 2 shows the gun safety device 10 installed in a revolver. The breech member 15 and bore member 20 are exactly as described above except that the overall length of the assembly 10 need be only approximately 10% longer than the length of the revolver cylinder 30.

The installation of the gun safety device can be easily and safely accomplished in the following manner.

For automatic and semiautomatic fire arms . . .

- (a) Remove magazine from the firearm and any live cartridges from the breech or firing chamber.
  - (b) Open access to the breech and insert breech member 15 into the breech or firing chamber.
  - (c) Lock breech member 15 in place by moving slide 35 into the closed position.
  - (d) Insert bore member 20 breech end 45 first into muzzle of the barrel and connect the bore member 20 to the breech member 15 using tooling specified for the safety device employed.
  - (e) Move the slide 35 back to the eject position and check to insure that the two members are correctly connected and the breech member 15 is not ejected.
  - (f) The magazine may now be installed.
- For use on revolvers . . .
- (a1) Remove all live ammunition and empty casings from the revolver cylinder 30.
  - (b1) Insert the breech member 15 into the cylinder 30 of the revolver.
  - (c1) Insert live cartridges into the remaining chambers of the revolver cylinder 30.
  - (d1) Return cylinder to the closed position and manually rotate the cylinder to align the breech member 15 with the revolver barrel.
  - (e1) Insert the bore member 20 breech end 45 first into the muzzle of the revolver barrel and connect the two members using tooling 55 specified for the safety device employed.
  - (f1) Invert the revolver (muzzle pointed vertically down) and ensure that the muzzle member 20 does not fall free and that the chamber 30 can not be rotated manually.

Note: For added safety insertion of live rounds or insertion of a loaded magazine may be postponed until after removal of the safety device and prior to intentional discharge of the firearm. Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention.

4

Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

We claim:

1. A breech block firearm safety device in combination with a fire arm having a breech, a barrel having a breech end and a bore end, said firearm having a caliber, an action, a cartridge extractor, an ejection mechanism having specific ejection clearance dimensions, the breech block firearm safety device comprising:

a) a solid one piece single casing breech member, having a breech end and a bore end, for insertion into said breech and preventing unintentional loading of said firearm, said breech member having the same outside dimensions and configuration as a single casing of said firearm caliber ammunition, and having said bore end tapped to accept an attaching means;

b) a solid cylindrical bore member having a breech end and a bore end, said breech end fitted with said attaching means for attaching said bore member to said breech member, said bore member having a diameter slightly less than the diameter of said barrel, and having sufficient length to produce an assembled breech block firearm safety device longer than said ejection clearance.

2. The bore member recited in claim 1 wherein the bore end is configured to accept specialized tooling for the attachment of said bore member to said breech member and removal of said bore member from said breech member.

3. A fire arm breech block safety device in combination with a firearm having multiple breech cavities contained within a cylinder, a barrel having a breech end and a bore end, said firearm having a caliber, the breech block firearm safety device comprising:

a) a solid one piece single casing breech member, having a breech end and a bore end, for insertion into one of said breech cavities and preventing unintentional loading of said firearm, said breech member having the same outside dimensions and configuration as a single casing of said firearm caliber ammunition, and having said bore end tapped to accept an attaching means;

b) a solid cylindrical bore member having breech end and a bore end and a diameter slightly less than the bore of said barrel and having sufficient length to produce an assembled firearm safety device longer than the breech cavities in said cylinder and prevent the rotation of said cylinder, and having said attaching means attached to the bore end of said bore member.

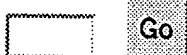
4. The bore member as recited in claim 3 wherein the bore end of said bore member is configured to accept specialized tooling for the attachment and removal of the bore member from the breech member.

\* \* \* \* \*



▲ Full Text  
? Help

Go to Page:



### Sections:

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 06237272

Section: Front Page 1 of 8 pages

[Help](#)



US006237272B1

## (12) United States Patent Scott

(10) Patent No.: **US 6,237,272 B1**  
(45) Date of Patent: **\*May 29, 2001**

### (54) BREECH BLOCK SAFETY DEVICE

(75) Inventor: **Randy Lee Scott**, 17849 Stella Solaris /  
P.O. Box 340, Lakehead, CA (US)  
96051

(73) Assignee: **Randy Lee Scott**, Lakehead, CA (US)

(\*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **08/725,606**

(22) Filed: **Oct. 3, 1996**

(51) Int. Cl.: **F41A 17/44**

(52) U.S. Cl.: **42/70.11; 42/77**

(58) Field of Search **42/70.11, 9, 2, 42/14, 26, 40; 89/145, 153, 164**

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5,179,234 \* 1/1993 Cvetanovich 42/70.11  
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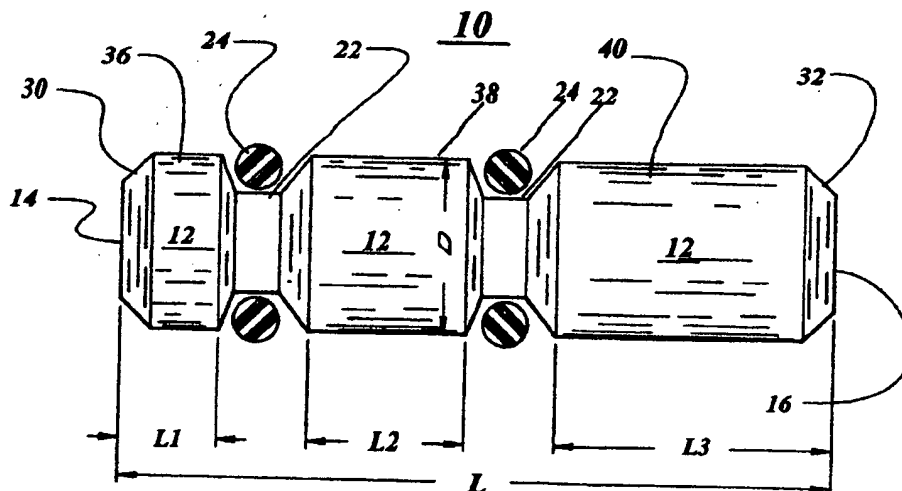
Primary Examiner—Charles T. Jordan

Assistant Examiner—Denise J. Buckley

### (57) ABSTRACT

A breech block safety device for preventing weapons from being accidentally loaded while at home or on display in businesses and military applications. The breech block device utilizes two O-rings and the two grooved angles in which the O-rings are seated, that serves to secure and hold the safety breech block in location. The use of the O-rings and grooves ensures a firm hold in the chamber, plus the angles of the seat walls cause a easy insertion and a restricted extraction of the plug. The composition of the breech block makes it inexpensive for mass production and manufacturing techniques. The two O-rings fit within the two grooves that is slightly wider than the thickness of the O-ring which causes the a easy insertion and a secure hold in the chamber and a restricted extraction with no shearing of the O-rings. Once inserted, the breech block is entirely within the firing chamber and thus does not interfere with the operating action of the weapon, other than the weapon can not be accidentally loaded, until breech block is removed. The breech block can only be removed by a cleaning rod inserted through the muzzle to force the breech block out of the firing chamber. The use of bright colors or materials enables the weapon breech to be inspected and visual sighting can be made easily for "safety".

12 Claims, 3 Drawing Sheets





Patent Number: 06237272

Section: Drawings 4 of 8 pages

[Help](#)

U.S. Patent

May 29, 2001

Sheet 3 of 3

US 6,237,272 B1

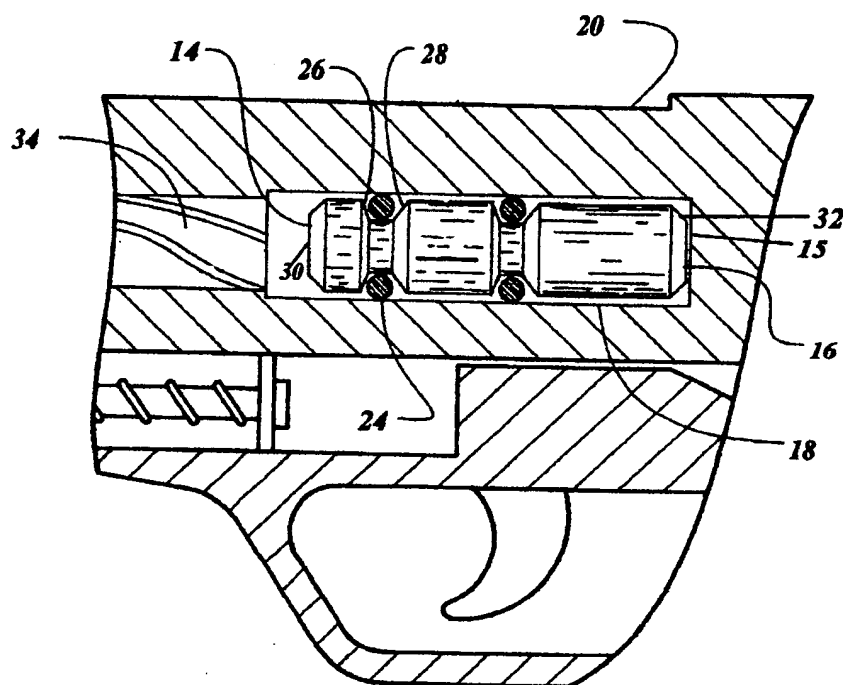
[Full Text](#)[Help](#)

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

FIG. 3



▲ **Full Text**  
? **Help**

Go to Page:


**Sections:**

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 06041536

Section: Front Page 1 of 8 pages

[Help](#)



US006041536A

**United States Patent** [19]

Samuels et al.

[11] **Patent Number:** 6,041,536

[45] **Date of Patent:** Mar. 28, 2000

[54] **SECURITY LOCK FOR REVOLVER TYPE HANDGUNS**

[76] **Inventors:** Arnold J. Samuels; Kathleen DeWain Samuels, both of 7516 Rangeview Rd., Sacramento, Calif. 95828

[21] **Appl. No.:** 09/335,074

[22] **Filed:** Jun. 17, 1999

**Related U.S. Application Data**

[63] Continuation-in-part of application No. 09/189,390, Nov. 10, 1998, abandoned.

[51] **Int. Cl.<sup>7</sup>** ..... F41A 17/16

[52] **U.S. Cl.** ..... 42/70.11

[58] **Field of Search** ..... 42/70.11

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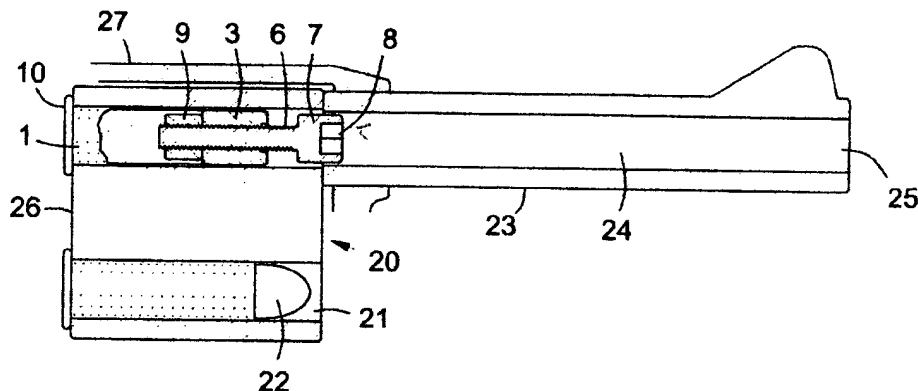
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*Primary Examiner*—Charles T. Jordan  
*Assistant Examiner*—Denise J. Buckley  
*Attorney, Agent, or Firm*—John V. Stewart  
[57] **ABSTRACT**

A dummy cartridge is placed in the firing chamber of a revolver. A machine screw in the front of the cartridge is then turned to extend forward partly into the barrel, preventing both firing of the gun and rotation of the cylinder. The screw is turned by a key inserted through the barrel from the muzzle. The key can be stored separately from the gun, so the gun owner, knowing its location, can quickly unlock the gun, but an intruder cannot use the gun. All chambers in the revolver cylinder except one can be loaded with live ammunition, so the gun can quickly be used for self-defense after unlocking. However, if the gun is locked without live ammunition, none can be added to any chamber until the gun is unlocked, which is ideal for firearm display applications. The dummy cartridge has means to prevent its turning in the chamber, so the key will turn the screw instead of the cartridge. The key fits closely within the barrel to center the key tip and align it with the screw head for immediate coupling.

7 Claims, 3 Drawing Sheets



Patent Number: 06041536

Section: Drawings 3 of 8 pages

[Help](#)

U.S. Patent

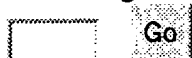
Mar. 28, 2000

Sheet 2 of 3

6,041,536

▲ **Full Text**  
? **Help**

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

FIG 5

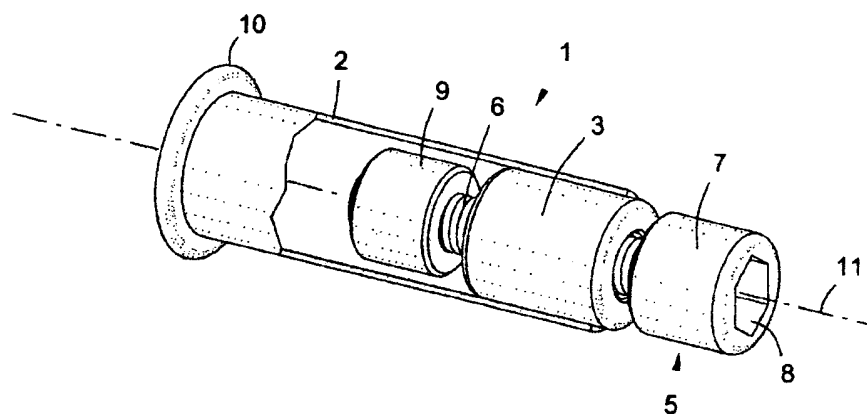


FIG 6

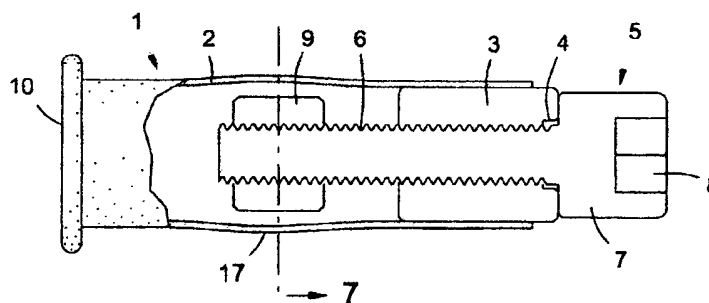
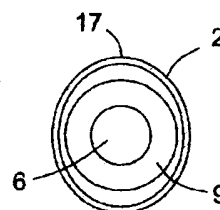


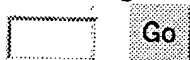
FIG 7





▲ Full Text  
? Help

Go to Page:



**Sections:**

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 05950344

Section: Front Page 1 of 14 pages

Help



US005950344A

**United States Patent** [19]

Ross

[11] Patent Number: **5,950,344**

[45] Date of Patent: **Sep. 14, 1999**

[54] **QUICK-RELEASE GUN LOCK**

[76] Inventor: **Larry Ross**, P.O. Box 1429, Idyllwild, Calif. 92599

5,450,685 9/1995 Peterson ..... 42/70.11  
5,664,358 9/1997 Haber et al. .... 42/70.11

[21] Appl. No.: **08/960,704**

[22] Filed: **Oct. 30, 1997**

Primary Examiner—Charles T. Jordan  
Assistant Examiner—Denise J Buckley  
Attorney, Agent, or Firm—Steins & Associates

[51] Int. Cl.<sup>6</sup> ..... **F41A 17/00**

[52] U.S. Cl. .... **42/70.11**

[58] Field of Search ..... **42/70.11, 96**

[57] **ABSTRACT**

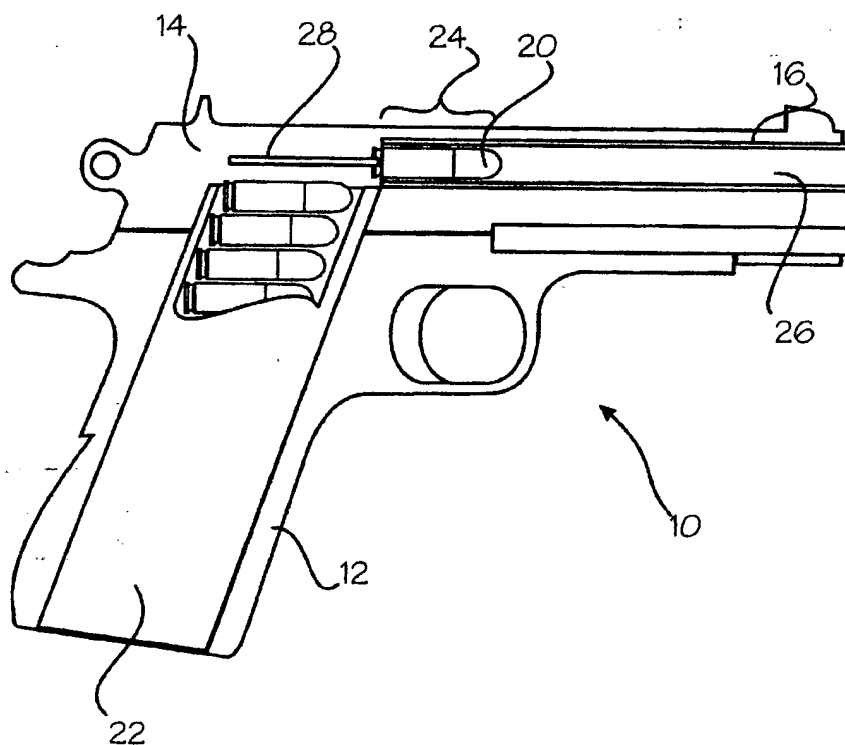
A Quick-release Gun Lock is disclosed. The gun lock comprises a base that cooperates with the gun's extractor, a pliable and expandable portion attached to the base for expanding to create an interference fit with the gun's bore, and a compression shaft that, when rotated, will force the expandable portion outwardly to create the interference fit. The device may further include a cam hub that interacts with the compression shaft to provide the desired interference fit with less than one rotation.

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**10 Claims, 9 Drawing Sheets**



Patent Number: 05950344

Section: Drawings 6 of 14 pages

[Help](#)

U.S. Patent

Sep. 14, 1999

Sheet 5 of 9

5,950,344

▲ Full Text  
? Help

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

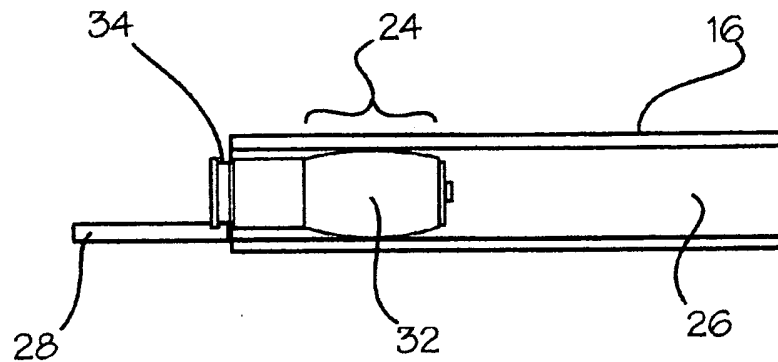


FIGURE 6

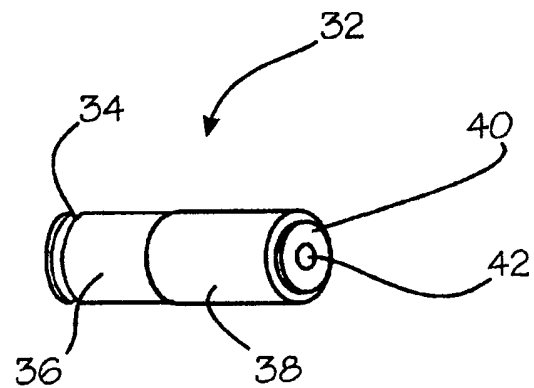


FIGURE 7





Patent Number: 05950344

Section: Drawings 2 of 14 pages

[Help](#)

U.S. Patent

Sep. 14, 1999

Sheet 1 of 9

**5,950,344**

▲ **Full Text**  
? **Help**

Go to Page:

Go



Sections:

- Front Page
- Drawings
- Specifications
- Claims

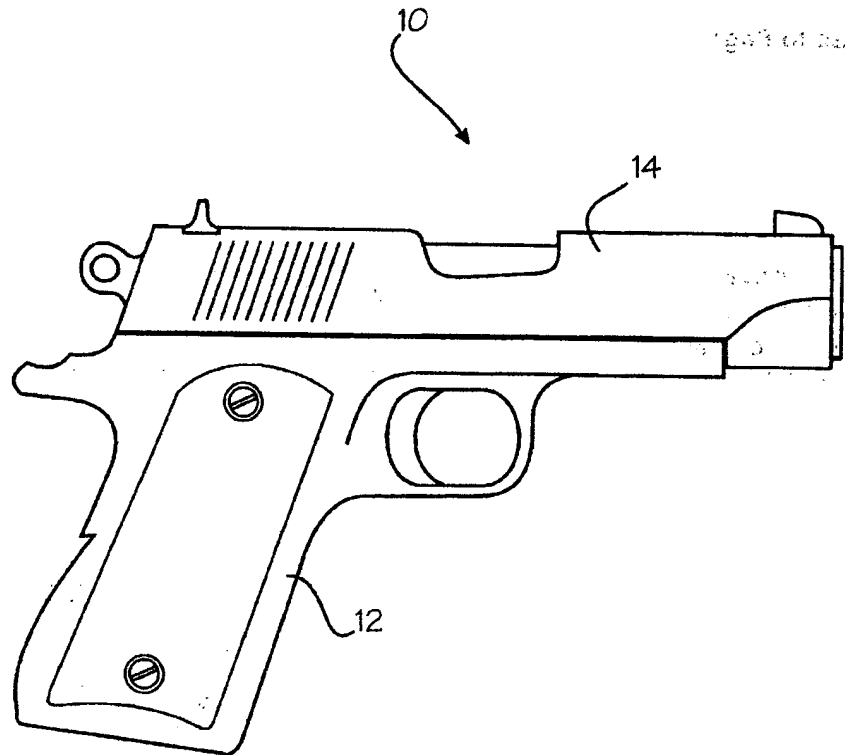


FIGURE 1

Patent Number: 05950344

Section: Drawings 3 of 14 pages

[Help](#)

U.S. Patent

Sep. 14, 1999

Sheet 2 of 9

5,950,344

▲ Full Text  
? Help

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

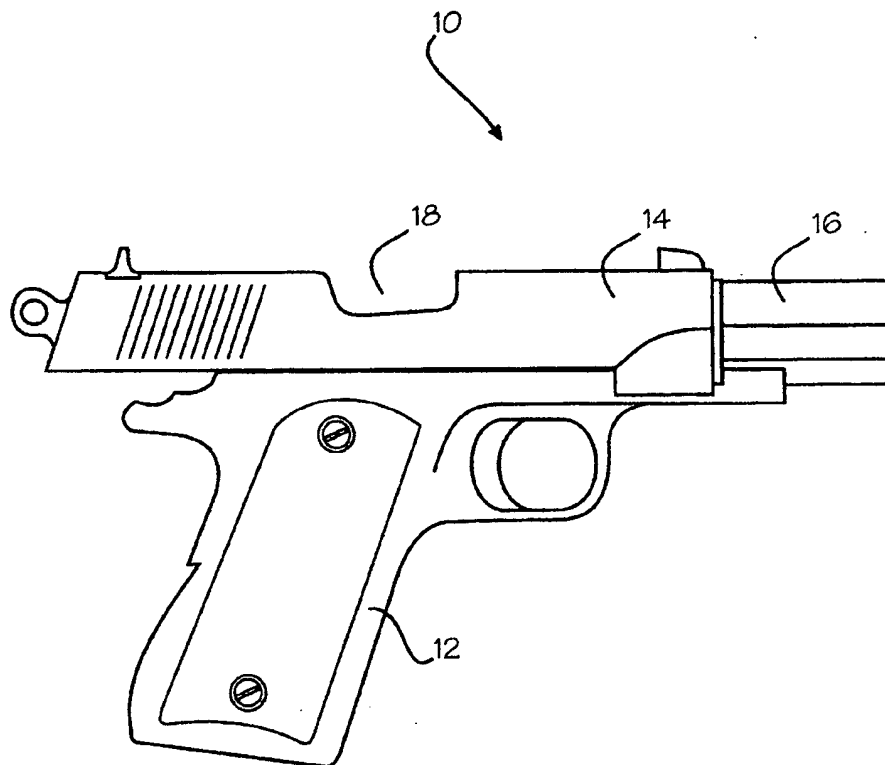


FIGURE 2

Patent Number: 05950344

Section: Drawings 4 of 14 pages

[Help](#)

U.S. Patent

Sep. 14, 1999

Sheet 3 of 9

5,950,344

▲ Full Text  
? Help

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

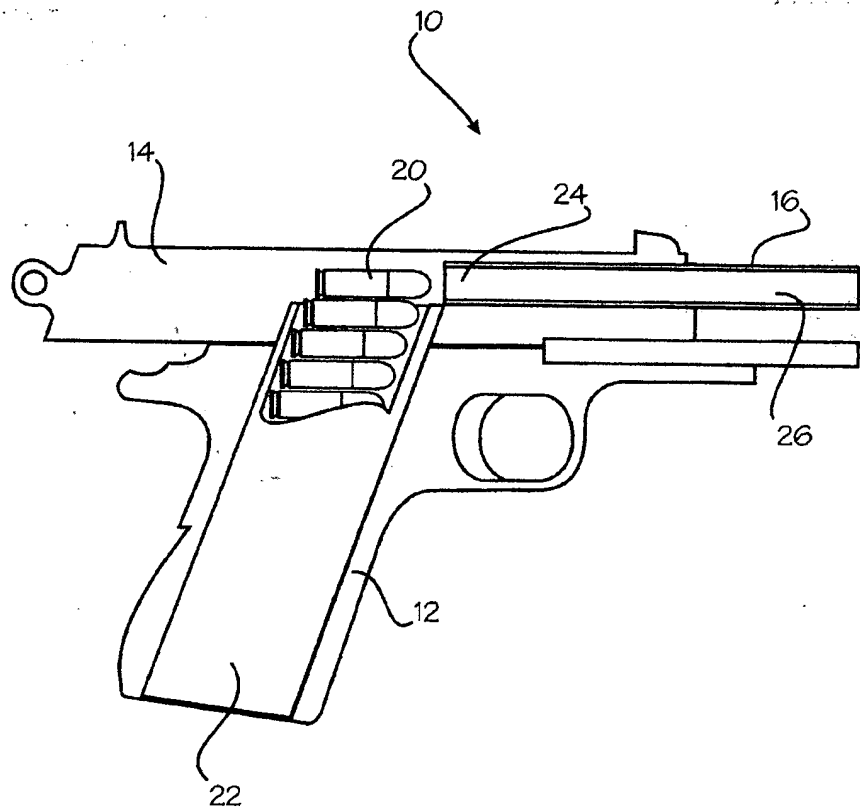


FIGURE 3

Patent Number: 05950344

Section: Drawings 5 of 14 pages

[Help](#)

U.S. Patent

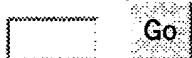
Sep. 14, 1999

Sheet 4 of 9

5,950,344

▲ **Full Text**  
? **Help**

Go to Page:



Sections:

- Front Page
- Drawings
- Specifications
- Claims

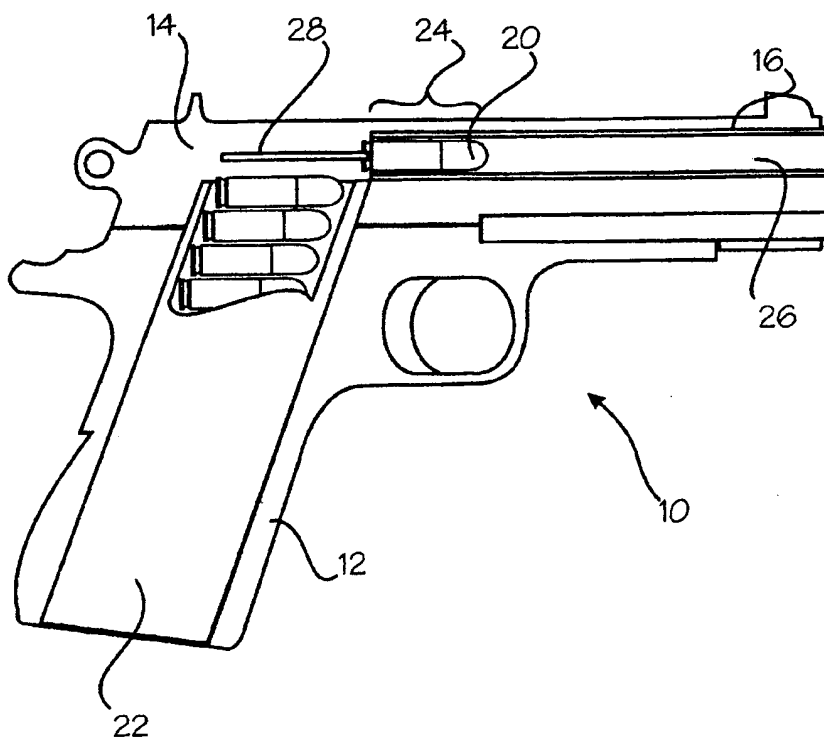


FIGURE 4

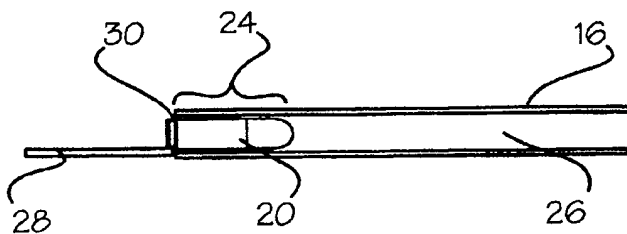


FIGURE 5

Patent Number: 05950344

Section: Drawings 7 of 14 pages

[Help](#)

U.S. Patent

Sep. 14, 1999

Sheet 6 of 9

5,950,344

▲ Full Text  
? Help

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

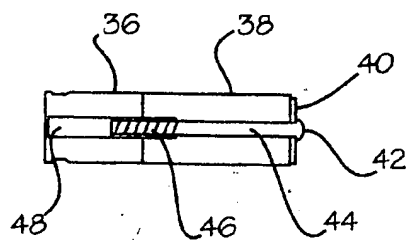


FIGURE 8A

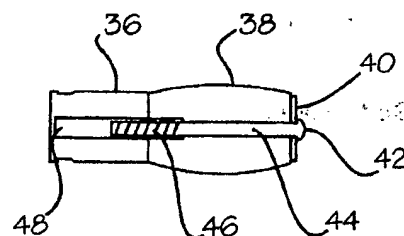


FIGURE 8B

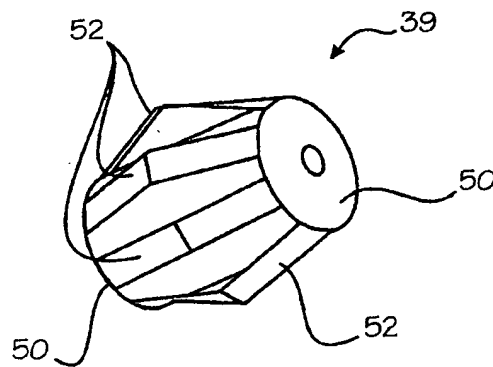


FIGURE 9

Patent Number: 05950344

Section: Drawings 8 of 14 pages

[Help](#)

U.S. Patent

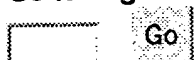
Sep. 14, 1999

Sheet 7 of 9

5,950,344

[Full Text](#)  
[Help](#)

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

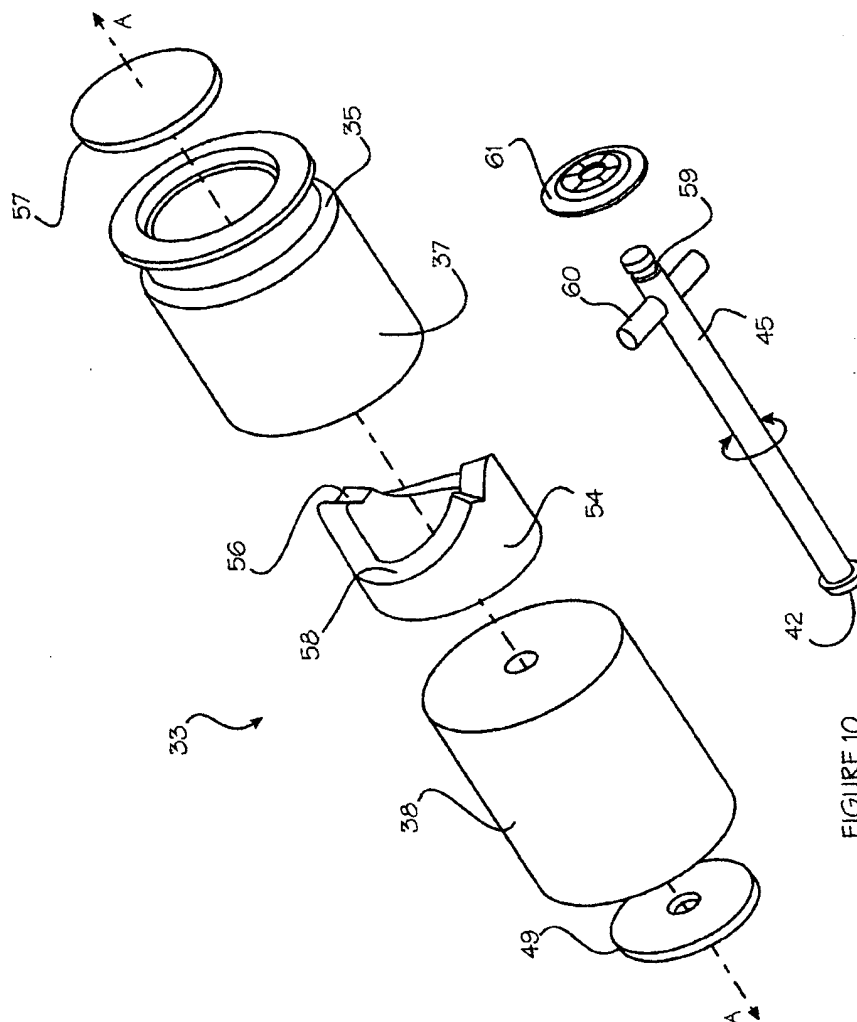


FIGURE 10

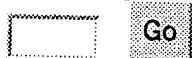
Patent Number: 05950344

Section: Drawings 9 of 14 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

U.S. Patent

Sep. 14, 1999

Sheet 8 of 9

5,950,344

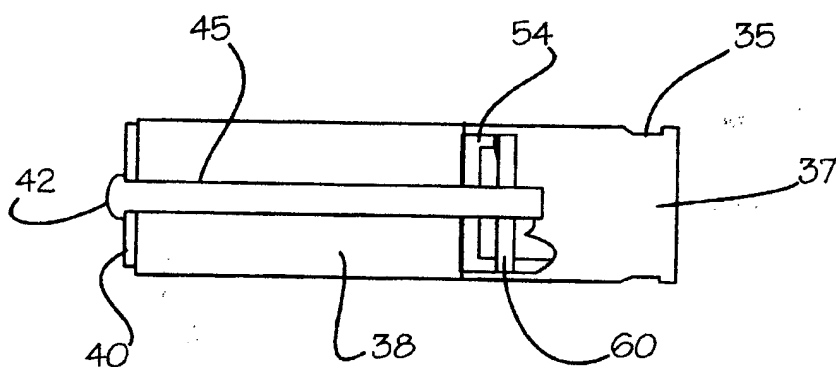


FIGURE 11

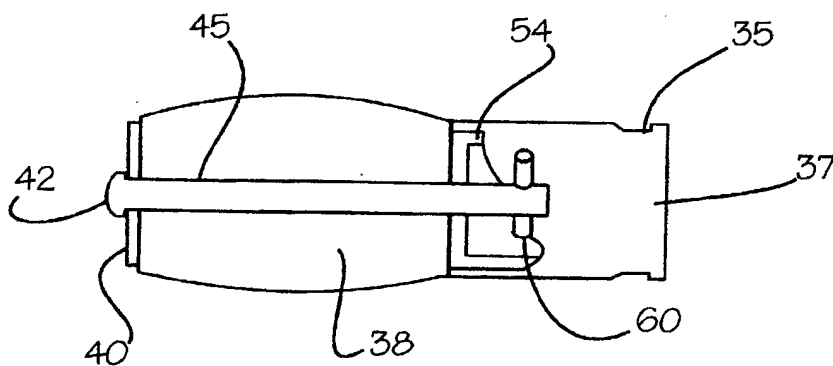


FIGURE 12

Patent Number: 05950344

Section: Drawings 10 of 14 pages

[Help](#)

U.S. Patent

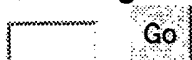
Sep. 14, 1999

Sheet 9 of 9

5,950,344

▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

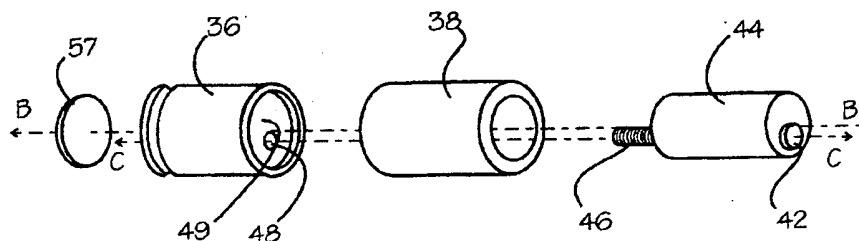


FIGURE 13

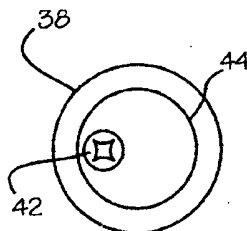


FIGURE 14A

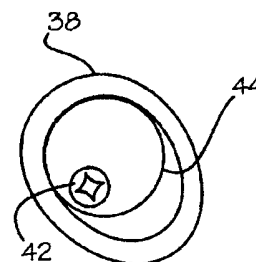


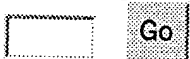
FIGURE 14B





▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

1

## QUICK-RELEASE GUN LOCK

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates generally to tamper-proof locks for firearms and, more specifically, to a Quick-release Gun Lock.

#### 2. Description of Related Art

Guns and other firearms have been in use by society for its protection and recreation for centuries. In recent years, with escalating crime levels, and particularly in attacks at the home, people have contemplated arming themselves. To have a weapon in the home can provide a feeling of security for many people. Historically, there have been two problems with keeping a firearm in the home: (1) preventing children from getting injured while playing with a loaded gun, and (2) preventing an intruder from getting to the weapon first and using it against the victims. As a result, even if a person does keep a gun in the home, it is usually not loaded. An unloaded gun can actually be more dangerous than a loaded one, since it can usually only be a deadly bluff to the future invader. What is needed is a device that permits a gun to be loaded and ready for use, while still preventing injury to children, as well as keeping an intruder from using the gun against the victims.

Semi-automatic weapons have become particularly popular for self-defense purposes because they can fire quicker and they hold more rounds than a revolver. While other prior devices have attempted to solve the gun safety problem for revolvers or rifles, none has been effective for semi-automatic weapons. FIGS. 1 through 5 will introduce the reader to the problems with locking semi-automatic pistols.

FIG. 1 depicts a conventional semi-automatic pistol 10. The pistol 10 comprises two major structures: the handle portion 12 and the slide 14. The slide 14 is permitted to slide along the handle portion 12 during the operation of the pistol 10.

FIG. 2 depicts the pistol 10 with the slide 14 in the recoil position, such as is the case when the slide 14 recoils immediately after a shot is fired. As can be seen, the slide 14 has traveled towards the left with respect to the handle portion 12. The barrel 16 is exposed in this position, and the spent shell exit 18 is open to the chamber (see FIG. 3). If a shot had just been fired, the spent shell casing would have been drawn out of the chamber by the extractor (see FIG. 3), which is attached to the slide 14. The extractor (see FIG. 3) also ejects the spent shell casing out of the chamber through the spent shell exit 18.

FIG. 3 is a partial cutaway side view of the typical semi-automatic pistol 10, depicting some of the inner workings as pertinent to the present invention. The slide 14 is in the recoil position in this view to depict what happens immediately after the spent shell casing has been ejected. The position shown could also be the result of manually cocking the pistol by grasping the slide 14 with the hand and pushing it to the left with respect to the handle portion 12.

When the slide 14 is cocked, a round 20 is dispensed by the magazine 22 into the vicinity of the chamber 24. The chamber 24 is the end of the barrel 16 from where rounds 20 are fired. The chamber 24 may be of larger diameter than the center of the barrel 16 (i.e. the bore 26), or the bore 26 may be the same diameter from the tip of the barrel 16 to the chamber 24.

FIG. 4 depicts the pistol 10 once the slide 14 has returned to the uncocked or ready position. When the slide 14 travels

2

forwardly, it forces the round 20 into the chamber 24; the mechanism that accomplishes this is not pertinent to this discussion, and is therefore not shown. If one can imagine that the bullet has been fired out through the bore 26, and that now the round 20 is actually a spent shell casing, we can proceed to understanding the functioning of the pistol 10.

While a round is in the chamber 24, it is engaged by the extractor 28. As described above in connection with FIGS. 1 and 2, when a shot is fired, the slide 14 would recoil by traveling to the left. Since the extractor 28 is attached to, and travels with, the slide 14, when the slide 14 recoils, the extractor 28 will remove the spent shell casing (imagine as the round 20) by pulling it backward and out of the chamber 24. Once free from the chamber 24, the spent shell casing (imagine as the round 20) will be aligned with the spent casing exit (see FIG. 1), through which it is ejected through, also by the extractor 28.

FIG. 5 further shows how the extraction process operates. FIG. 5 is a partial cutaway top view of the pertinent components of the pistol. As can be seen, the extractor 28 is a spring-loaded "finger" that grabs onto the groove 30 that is located at the bottom of the spent shell casing (imagine as the round 20).

Rockwood, U.S. Pat. No. 3,382,596, discloses a "Safety Plug for Firearm Chamber" that is, essentially, a two-piece unit that fits into the chamber and thereafter prevents a round from being loaded. There are at least three problems with the Rockwood device as it applies to semi-automatic pistols. First, the device would be easily removed from the pistol by an intruder or child, by simply jamming a stick into the barrel and poking the device out through the spent casing exit. Second, the device cannot be hidden from the potential intruder in order to prevent its removal. All that the intruder has to do is to cock the slide and look into the spent shell exit to see the device and therefore determine how to remove it. Third, there is no quick way to remove the two-piece Rockwood device. If the device is inserted with an interference fit, as described (see Column 3, line 3), it must be jammed out by a stick inserted into the barrel—this process could take more time than is available in an emergency situation. What is needed is a locking device for semi-automatic and automatic pistols that is disguised while in use to prevent unauthorized users from removing it. The device should also be extremely quick and easy to remove in case of emergency.

Another device, the "Safety Device for Firearms" disclosed in S. Pula et al., U.S. Pat. No. 2,836,918, is unworkable for the semi-automatic or automatic weapon. The Pula device has at least three problems with its design. First, the design is extremely complicated, and therefore not cost-effective. In order for this device to gain wide-spread popularity, and therefore use and protection, it must be reliable but also fairly inexpensive. The Pula device is cost-prohibitive as designed. Second, the Pula device, like the Rockwood device, is difficult and slow to remove. Presumably, (although the removal process is not disclosed by Pula) the device is removed by unscrewing the plug 18, by engaging the tool 23 with either the front or rear kerf 20 and 21, respectively. The device is then poked or shaken out of the chamber. Again, the time to execute these steps may not be available. Third, the Pula device must be made from metal in order to provide the necessary durability to the expanded segments 17. The insertion of a metal device into the chamber that is then pressed outwardly into the bore walls, may actually mar the surface of the chamber and damage the gun. What is needed is a low-cost, reliable, quickly-removable gun lock that will not damage the inner workings of the gun.



▲ Full Text  
? Help

Go to Page:



#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,950,344

3

#### SUMMARY OF THE INVENTION

In light of the aforementioned problems associated with the prior devices, it is an object of the present invention to provide a Quick-release Gun Lock. It is a further object that the gun lock the chambering and firing actions of automatic weapons, while still permitting the triggering action to work. It is a still further object that the locking device be easily installed through the gun's spent shell exit, and that it be quickly released via a tool inserted into the bore, and ejected via the spent shell exit. It is a still further object that the device be concealed from view to prevent tampering. It is yet another object that the device be manufactured from low-cost designs and materials and that the device not cause damage to the inner workings of the weapon.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The objects and features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages, may best be understood by reference to the following description, taken in connection with the accompanying drawings, of which:

FIG. 1 is a side view of a typical semi-automatic pistol

FIG. 2 is a side view of the pistol of FIG. 1, with the slide in the recoiled position;

FIG. 3 is a cutaway side view of the pistol of FIG. 2, with the slide in the recoiled position;

FIG. 4 is a cutaway side view of the pistol of FIG. 1, with the slide in the extended position;

FIG. 5 is a cutaway top view of the barrel of the pistol of FIG. 4;

FIG. 6 is a partial cutaway top view of the barrel of FIG. 5, depicting a preferred locking device of the present invention;

FIG. 7 is a perspective view of the preferred embodiment of the present invention of FIG. 6;

FIGS. 8A and 8B are a pair of cutaway side views of the preferred embodiment of the present invention of FIGS. 6 and 7;

FIG. 9 is a perspective view of another preferred expandable portion;

FIG. 10 is an exploded perspective view of another preferred embodiment of the present invention;

FIG. 11 is a cutaway side view of the preferred embodiment of the present invention of FIG. 9, depicted in an uncompressed state;

FIG. 12 is a cutaway side view of the preferred embodiment of the present invention of FIGS. 9 and 10, depicted in a compressed state;

FIG. 13 is an exploded perspective view of another preferred embodiment of the present invention; and

FIGS. 14A and 14B are a pair of top views of the preferred embodiment of the present invention of FIG. 13, depicting the relaxed (14A) and locked or compressed (14B) positions.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following description is provided to enable any person skilled in the art to make and use the invention and sets forth the best modes contemplated by the inventor of carrying out his invention. Various modifications, however,

4

will remain readily apparent to those skilled in the art, since the generic principles of the present invention have been defined herein specifically to provide a Quick-release Gun Lock.

The present invention can best be understood by initial consideration of FIG. 6. FIG. 6 is a partial cutaway top view of a preferred locking device 32 of the present invention when installed in a typical chamber 24 of a semi-automatic or automatic weapon. As can be seen, the locking device 32 is expanded against the walls of the bore 26, like the Pula device, but the present invention has another benefit. There is a groove 34 that is formed in the locking device 32 that is very similar to the groove 30 found on a conventional round 20 (see FIGS. 1-5). If one returns to FIG. 4, it can be appreciated is that if the round 20 was "stuck" in the chamber and prevented from being removed, the extractor 28 could not pull the round 20 out of the chamber 24, and the slide 14 (which is attached to the extractor 28) could not be cocked or recoiled. Since the slide 14 could not be cocked, it would be impossible to look through the spent shell exit (see FIGS. 1 and 2) to determine what was preventing the slide (see FIGS. 1 and 2) from moving. Since the device 32 could not be viewed, it is very likely that an unauthorized user would not be able to determine how to load the gun or be able to remove the locking device 32. This is a significant benefit over the prior devices.

Another critical advantage must be appreciated. In order to remove the locking device 32, one need only release the force pressing against the walls of the chamber 24, and then cock the slide. When the slide is cocked now, the extractor 28 will pull the locking device 32 out of the chamber 24 via the groove 34, and the locking device 32 will be ejected through the spent casing exit (see FIG. 2), just like a spent casing. As this is done, a new round will be loaded into the chamber 24 when the slide is released. This process is extremely quick, with no wasted movement.

FIG. 7 gives further detail of the present invention. FIG. 7 is a perspective view of the preferred locking device 32 of FIG. 6. This preferred embodiment comprises a base 36, preferably of brass or aluminum or other material that is strong, yet will not damage the gun by its use. The groove 34 is cut in the base 36, much the same as in a round of ammunition. Attached to the base 36 is an expandable portion 38, made preferably of rubber or other pliable material that will deform under pressure, and then return to its original configuration once the pressure is released. At the end of the expandable portion 38 is a compression disc 40 and a socket 42. The operation of the device 32 is best understood by now considering FIG. 8.

FIGS. 8A and 8B are a pair of partial cutaway side views of the locking device of FIG. 7. View "A" depicts the device in a relaxed or unexpanded condition, such as prior to locking the gun. View "B" depicts the device in an expanded condition, such as when the device is installed and locked inside the chamber of a gun (see FIG. 6).

The socket 42 is the tip of the compression shaft 44. The compression shaft 44 runs through a bore in the center of the expandable portion 38 and terminates in a threaded portion 46. The threaded portion 46 engages the threaded tube 48 that is formed within the base 36. As can be seen, therefore, one need merely to turn the socket 42, which will turn the compression shaft 44, thereby causing the threaded portion 46 to bore into the threaded tube 48, and causing the expandable portion 38 to be compressed by the compression disc 40. When compressed, the expandable portion 38 is configured to expand outwardly (such as into the walls of a

Patent Number: 05950344

Section: Claims 13 of 14 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,950,344

5

firing chamber). When the compressing forces are removed, the expandable portion 38 will return to its original configuration, permitting the device to be removed quickly by simply cocking the slide.

The compression disc 40 may be made from conventional rigid materials, such as in a washer. The socket 42 could be keyed to accept only the owner's tool (inserted down the barrel of the weapon) to engage and disengage the device. The expandable portion 38 of this embodiment is preferably made from rubber or other material which will expand laterally when its ends are compressed, and then return to its original configuration once the compressive forces are removed. It must be appreciated that an expandable portion 38 made from rubber is a novel solution, since it is easy to machine to the proper dimensions to fit into the chamber (i.e. no tight manufacturing tolerances). The rubber also expands greatly under little or no compression, which means that a tight interference fit can be created by barely turning the compression shaft 44.

FIG. 9 depicts an alternative expandable portion 39. As can be seen, this expandable portion 39 comprises a pair of ends 50 which are connected to each other by a plurality of fins 52. When the ends 50 are pressed towards one another, the fins 52 will be forced outwardly, just as with the aforementioned embodiment of the expandable portion 38. This expandable portion 39 might be preferred for some circumstances, however, will most likely result in higher manufacturing costs than the expandable portion 38.

Now turning to FIG. 10, one might understand yet another embodiment of the present invention. FIG. 10 is an exploded perspective view of a preferred locking device 33. The device 33 comprises a base 37 that includes a groove 35 which is engagable to the extractor (see FIGS. 3-6). Also shown in this embodiment is a disc 57, preferably of plastic or other malleable material, inserted into the end of the base 37. The plastic disc 57 will permit the user to "dry-fire" the weapon once the locking device is installed without causing damage to the firing pin (not shown). Within the base 37 is a cam hub 54 that includes a shallow notch 56 and a deep notch 58. The cam hub 54 is attached to the base 37 to prevent rotational or lateral motion.

As with the previous embodiment of the present invention, there is an expandable portion 38 and a compression disc 49. The compression shaft 45 of the present embodiment has some differences. While it terminates in a conventional socket 42 at one end, it terminates in a follower member 60 at the other end. The follower member is configured to engage the shallow and deep notches 56 and 58, respectively, when the compression shaft is pressed axially and turned. As should be appreciated, only a 1/2 turn of the compression shaft 45 will result in engagement or disengagement of the compressive forces. At the end of the compression shaft 45, there may be a snap-washer 61 or the like to center and retain the compression shaft 45 within the apparatus. The snap-washer 61 or the like attaches to the compression shaft 45 by snapping into groove 59.

FIGS. 11 and 12 depict the two operating configurations of this alternative embodiment of the present invention. FIG. 11 is a cutaway side view showing the locking device 33 in an uncompressed state. As can be seen, the compression shaft 45 has been rotated such that the follower member 60 has fallen into the deep notch (see FIG. 10) of the cam hub 54. In this position, no compressive force is exerted on the compression disc 40 and therefore none is exerted on the expandable portion 38.

FIG. 12 is a cutaway side view showing the locking device 33 in a compressed state. As can be seen, the

6

compression shaft 45 has now been rotated such that the follower member 60 sits in the shallow notch (see FIG. 10). The user had to press down axially on the socket 42 before turning, and then turned the socket 42 1/4 of a turn and released the pressure. With the follower member 60 in the shallow notch, there is compressive force exerted on the compression disc 40 and expandable portion 38, causing the expandable portion 38 to expand. The user need only to press axially on the socket 42 and turn 1/4 of a turn again to release the locking device. This is a significant benefit over the prior devices.

Other configurations and numbers of these notches is conceived but not listed here for the sake of brevity. It should be appreciated that the function of the cam hub 54 is to interact with the compression shaft 45 to provide stops to compress and release the expandable portion 38.

FIGS. 13 and 14 depict yet another preferred embodiment of the present invention. FIG. 13 is an exploded perspective view of this alternative embodiment. As with the embodiment of FIGS. 6-9, this embodiment includes a base 36, an expandable portion 38, and a compression shaft 44. What is unique here is the inclusion of the plastic cap 57, as well as the configuration of the compression shaft 44 and socket 42. As can be seen, the centerline B-B of the base 36, expandable portion 38 and compression shaft 44 is not the same as the centerline C-C of the socket 42 and threaded portion 46. When the socket 42 is turned, therefore, the compression shaft 44 will actually rotate away from centerline B-B, thereby forcing the expandable portion 38 outward. Furthermore, while not shown in these figures for the sake of brevity, it should be appreciated that it might be desirable to include a ratcheting or other means for retaining the compression shaft 44 in one place after it has been rotated. This means may be a variety of forms, including ribbed washers, notches in the base 36, or other features that would hold the compression shaft 44 from rotating, including a "stop" at the end of travel back towards the relaxed position (see FIG. 14A). FIGS. 14A and 14B clearly depict this novel relationship.

FIGS. 14A and 14B are a pair of top views of the preferred embodiment of the present invention of FIG. 13, depicting the locking device in relaxed (14A) and locked or compressed (14B) positions. As can be seen in FIG. 14B, rotating the socket 42 causes the compression shaft 44 to rotate away from center, and thereby presses the expandable portion 38 outwardly (and into the bore walls).

Those skilled in the art will appreciate that various adaptations and modifications of the just-described preferred embodiment can be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

What is claimed is:

1. A lock for semi-automatic weapons said weapons comprising a chamber having inner walls, a recoiling slide and at least one extracting finger attached to said slide, said lock comprising:

a base comprising a groove for engagement with at least one said extracting finger;

a cam hub attached to said base;

an expandable portion adjacent to said base, said expandable portion comprising a pliable, elastic material, and further defined by a base end and an opposing tip end, said base end being adjacent to said base, said expandable portion being expandable to engage said walls to prevent said slide from recoiling;

Patent Number: 05950344

Section: Claims 14 of 14 pages

[Help](#)

[Full Text](#)  
[Help](#)

Go to Page:


## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,950,344

7

a compression shaft in engagement with said base and  
 said expandable portion to compress said expandable  
 portion said compression shaft further comprises a  
 follower portion for engagement with said cam hub to  
 provide a compressed position wherein said expand-  
 able portion is in a compressed state, and a relaxed  
 position wherein said expandable portion is in a relaxed  
 state;  
 a follower member attached to said compression shaft and  
 cooperating with said cam hub; and  
 a compression disc adjacent to said tip end and in co-  
 operation with said compression shaft to compress said  
 expandable portion.  
 2. The lock of claim 1, wherein said cam hub is further  
 defined by an axial bore, at least one shallow notch and at  
 least one deep notch, said notches configured to receive said  
 follower member.  
 3. A lock for semi-automatic weapons, said weapons  
 comprising a chamber having inner walls, a recoiling slide  
 and at least one extracting finger attached to said slide, said  
 lock comprising:  
 a base engageable with at least one said extracting finger  
 and further defining a first axis,  
 an expandable portion adjacent to said base and centered  
 along said first axis, said expandable portion being  
 expandable to engage said walls to prevent said slide  
 from recoiling, and  
 a compression shaft in engagement with said base and  
 rotatable around a second axis, and configured to  
 interact with said expandable portion to compress said  
 expandable portion.  
 4. The lock of claim 3, wherein:  
 said expandable portion is further defined by a base end  
 and an opposing tip end, said base end being adjacent  
 to said base, and

8

said lock further comprises a compression disc adjacent to  
 said tip end and in cooperation with said compression  
 shaft to compress said expandable portion.  
 5. The lock of claim 8, wherein said expandable portion  
 comprises a pliable, elastic material.  
 6. The lock of claim 5, wherein said expandable portion  
 comprises rubber.  
 7. The lock of claim 5, wherein said base further com-  
 prises a groove for engagement with said extracting finger.  
 8. The lock of claim 7, wherein:  
 said base further comprises a threaded tube for accepting  
 said compression shaft, and  
 said compression shaft further comprises a socket end  
 adjacent to said compression disc, a threaded end  
 opposite to said socket end and a threaded portion  
 adjacent to said threaded end, said threaded portion  
 configured to cooperate with said threaded tube.  
 9. The lock of claim 8, further comprising:  
 a cam hub attached to said base, and  
 said compression shaft further comprises a follower por-  
 tion for engagement with said cam hub to provide a  
 compressed position wherein said expandable portion  
 is in a compressed state, and a relaxed position wherein  
 said expandable portion is in a relaxed state.  
 10. The lock of claim 1, wherein:  
 said base further comprises a threaded tube for accepting  
 said compression shaft, and  
 said compression shaft further comprises a socket end  
 adjacent to said compression disc, a threaded end  
 opposite to said socket end and a threaded portion  
 adjacent to said threaded end, said threaded portion  
 configured to cooperate with said threaded tube.

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Patent Number: 05475994 Section: Front Page 1 of 15 pages

Help



▲ Full Text  
? Help

Go to Page:


## Sections:

- Front Page
- Drawings
- Specifications
- Claims

## United States Patent [19]

Briley, Jr. et al.

[11] Patent Number: 5,475,994

[45] Date of Patent: Dec. 19, 1995

## [54] HIGH SECURITY GUN LOCK DEVICE

[76] Inventors: William P. Briley, Jr., 1789 N. Carpenter Rd., Titusville, Fla. 32796; George T. Croft, 39 Acorn Ln., Hilton Head Island, S.C. 29928; Robert E. Schmeck, 111 Winty Point Cir., Marathon, Fla. 33050

[21] Appl. No.: 89,495

[22] Filed: Jul. 12, 1993

## Related U.S. Application Data

[62] Division of Ser. No. 848,341, Mar. 9, 1992, Pat. No. 5,239,767.

[51] Int. Cl.<sup>6</sup> E05B 17/00; E05B 67/36

[52] U.S. Cl. 70/34; 70/330; 70/311; 42/70.11

[58] Field of Search 70/14, 18, 34, 70/23, 330, 57, 58, 386, 387, 438, 311, 312, 320, 321, 329; 42/1.13, 44, 66, 70.01, 70.11, 96, 79

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Primary Examiner—Peter M. Cuomo

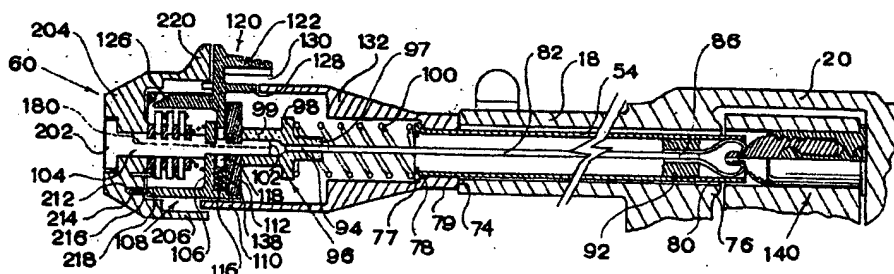
Assistant Examiner—Suzanne L. Dino

Attorney, Agent, or Firm—Martin D. Wittstein

## [57] ABSTRACT

A high security gun lock device is disclosed which has an elongate gripping and locking assembly that is inserted into the muzzle end of the barrel of a revolver or pistol type hand gun and which is then connected to a dummy round located in a cylinder chamber of the revolver or the firing chamber of the pistol. The dummy round has a bulbous head which is grasped by a plurality of expandable gripping fingers mounted on the inner end of the gripping and locking assembly to lock the latter to the former. An axially slidable actuating mechanism is manually operable to cause the gripping fingers to release the bulbous head of the bullet, and a spring biased interposer is normally operable to prevent movement of the actuating mechanism until a locking mechanism is set to a predetermined condition to permit operation of the interposer. The locking mechanism has features of construction which permit it to be manually operated solely by tactile perception of relatively movable parts, thereby allowing the gun lock device to be operated in the dark. An enhanced version of the dummy round provides for axial elongation and radial expansion of the bullet so that it jams in the inner end of the gun barrel if any attempt is made to forcibly remove the gripping and locking assembly from the gun without properly unlocking it.

6 Claims, 5 Drawing Sheets



Patent Number: 05475994

Section: Drawings 2 of 15 pages

[Help](#)

U.S. Patent

Dec. 19, 1995

Sheet 1 of 5

5,475,994

[Full Text](#)  
[Help](#)

Go to Page:

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

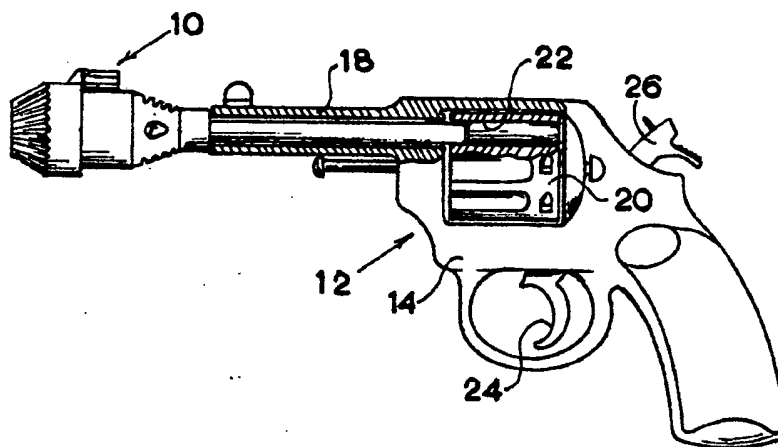


Fig. 1

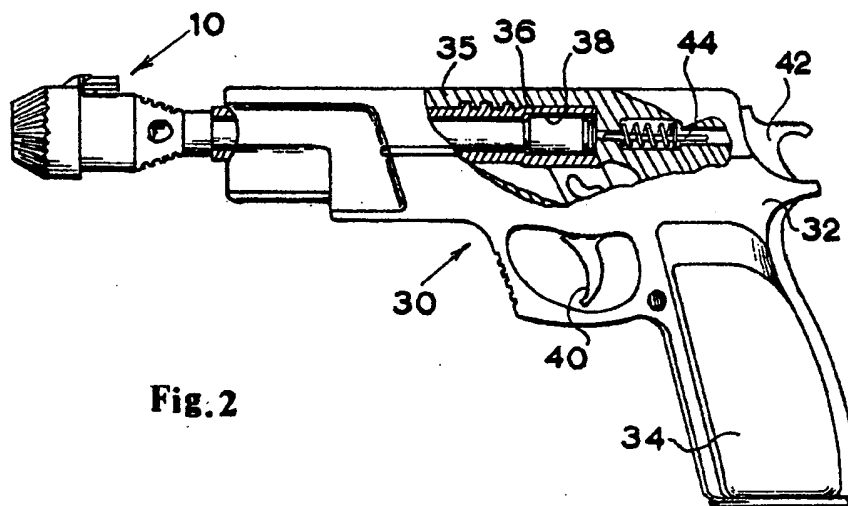


Fig. 2

Patent Number: 05475994

Section: Drawings 3 of 15 pages

[Help](#)



U.S. Patent

Dec. 19, 1995

Sheet 2 of 5

5,475,994

▲ Full Text  
? Help

Go to Page:

Go



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

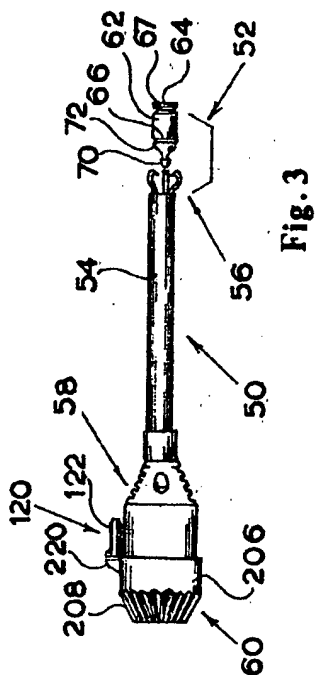


Fig. 3

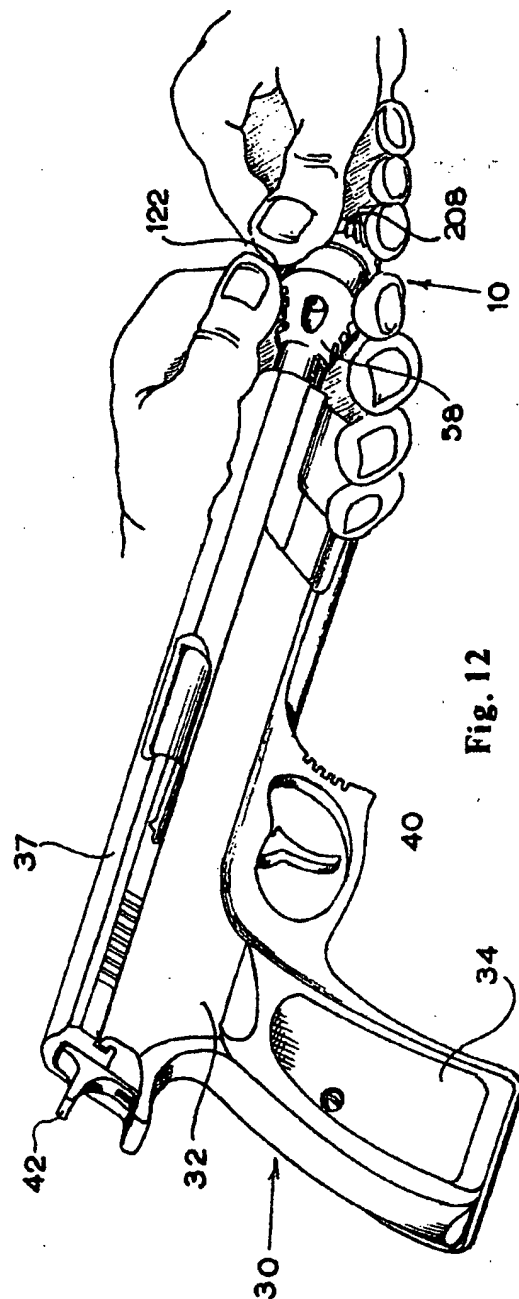


Fig. 12



U.S. Patent

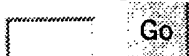
Dec. 19, 1995

Sheet 3 of 5

5,475,994

[Full Text](#)  
[Help](#)

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

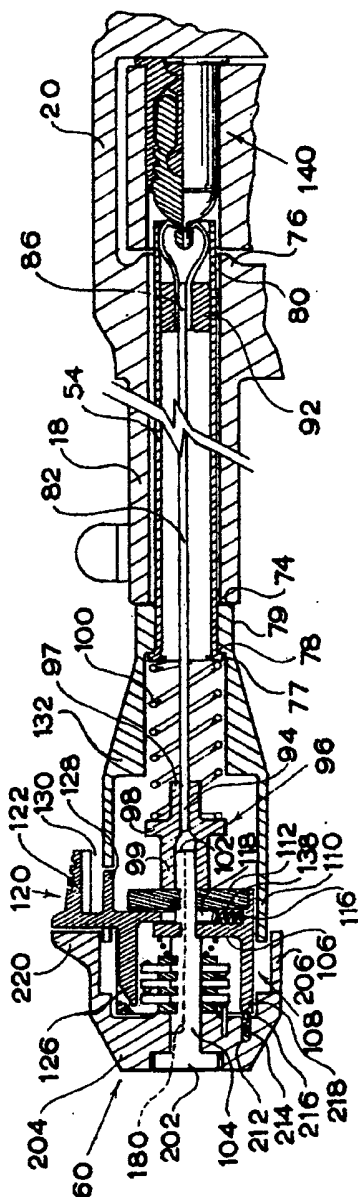


Fig. 4

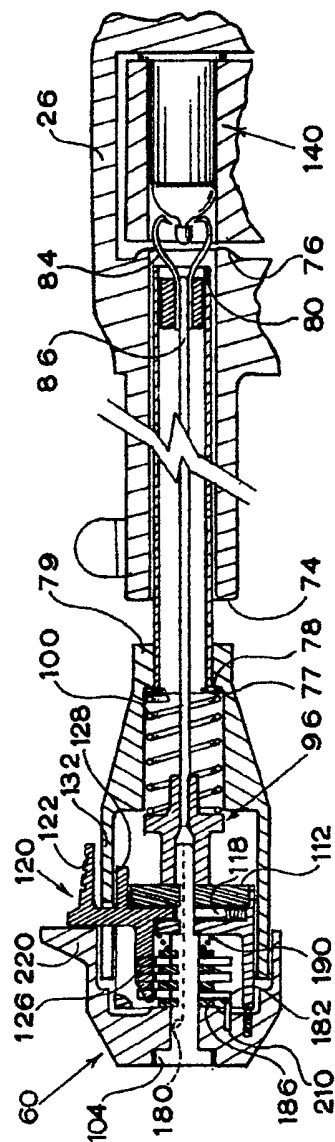


Fig. 5





U.S. Patent

Dec. 19, 1995

Sheet 4 of 5

5,475,994

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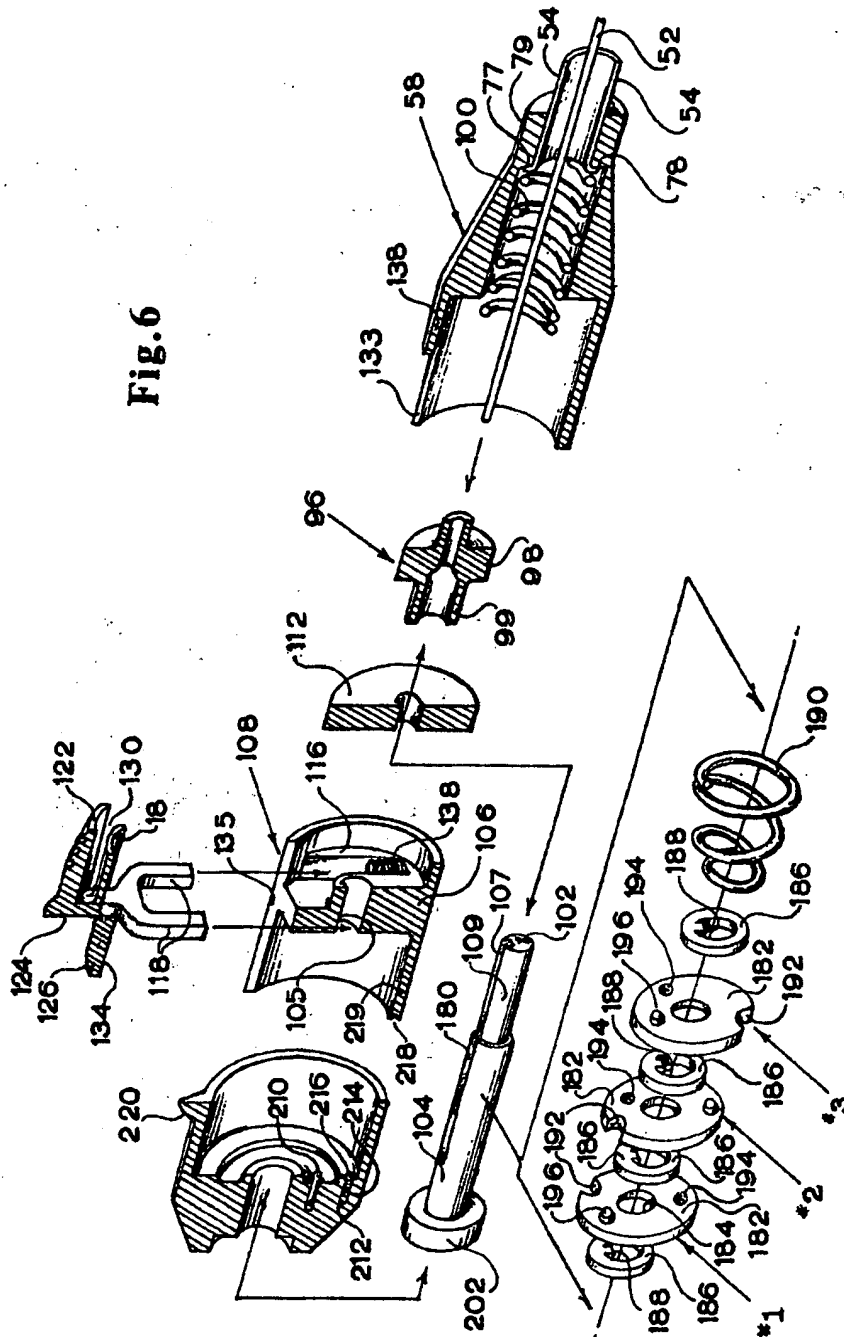
Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Fig. 6



Patent Number: 05475994

Section: Drawings 6 of 15 pages

[Help](#)

U.S. Patent

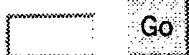
Dec. 19, 1995

Sheet 5 of 5

5,475,994

[Full Text](#)  
[Help](#)

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

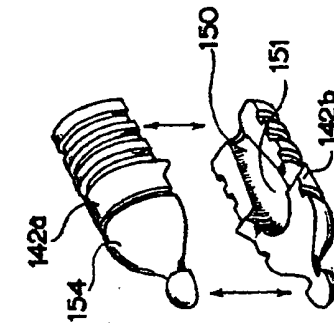


Fig. 8.

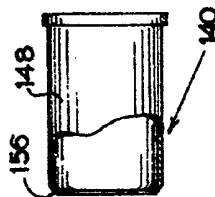


Fig. 7

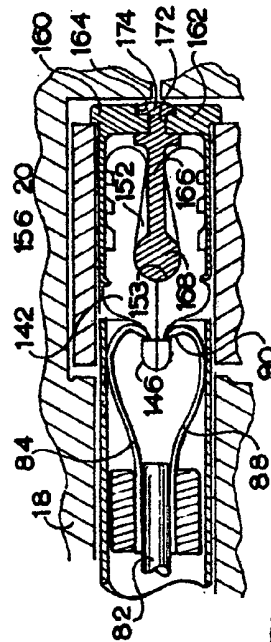
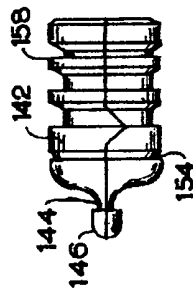
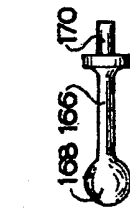


Fig. 9

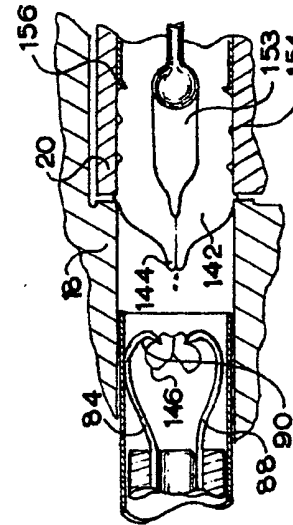


Fig. 11

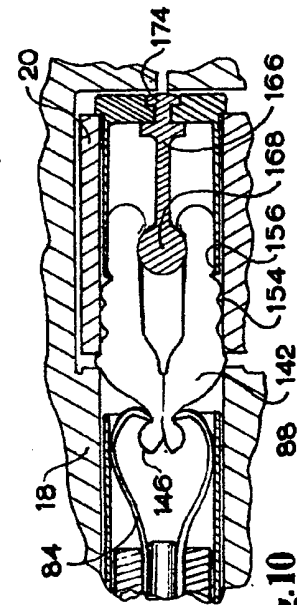


Fig. 10

Patent Number: 05475994

Section: Specifications 7 of 15 pages

Help



Full Text  
? Help

Go to Page:

 Go


Sections:

- Front Page
- Drawings
- Specifications
- Claims

5,475,994

1

## HIGH SECURITY GUN LOCK DEVICE

This application is a division of Ser. No. 848,341 filed Mar. 9, 1992 which is now U.S. Pat. No. 5,239,767.

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

The present invention relates generally to the field of gun lock devices, and more particularly to a high security gun lock device which can be attached to a revolver or automatic pistol type hand gun to render the gun completely inoperable by an unauthorized person regardless of whether the gun is loaded or unloaded.

As is generally known, there is such a proliferation of hand guns in use by the civilian population that it has become a national problem of major import. Hardly a day passes when the news media does not report the occurrence of a serious crime or suicide committed with the use of a hand gun, or the injury or death of an individual from an accidental gun shot wound. Hand guns typically appear at the focal point of many situations which result in serious injury or death, such as drug related crimes, racial violence, ordinary street crime, domestic quarrels and suicide, to mention a few. The United States civilian population has become the greatest gun culture in the world among developed countries, and is paying a staggering price in injuries and deaths.

Illustrative of the magnitude of the problem, various surveys taken from time to time concerning the firearm population in the United States report that there are at present in excess of 200 million firearms of all types in the hands of civilians, and approximately 5 million additional firearms are purchased each year. Of this total, approximately one third, or 60 to 70 million, are hand guns, with exponential increases over the past three decades. One of two households across the Country owns a hand gun, of which a substantial proportion keep their guns both loaded and readily available, i.e., not under any form of security, regardless of whether the security is a lock device attachable to the gun or the gun is placed in a secure location. And in the past decade, women have become a major purchaser of hand guns for their personal protection both in and out of the home. These surveys define hand guns as small concealable firearms which can be fired with one hand and which fire consecutive rounds from a built in rotating cylinder or grip stored magazine, such as with revolvers and pistols.

Various other surveys report the significance of this firearm population in terms of the injury and death that result from the use of these firearms. Injuries resulting from either the intentional or unintentional use of firearms constitute the second leading cause of death due to injury, exceeded only by death from motor vehicle accidents. For example, there are at least 40,000 deaths annually from all firearms, with about 50% of this number resulting from hand guns. Of the remaining approximately 20,000 deaths, about 55% are suicides, 40% homicides and 5% unintentional. It is noteworthy that over half of the more than 30,000 suicides annually are committed with hand guns. The risk of firearm death is highest for adolescents and young adults, and among children aged 14 and younger firearms are the fourth leading cause of unintentional death. It is axiomatic that with a given probability of both intentional and unintentional wounding and deaths associated with firearms, the ever increasing number of firearms in civilian hands will result in a correspondingly increasing number of such wounding and

2

deaths, all other factors being constant, for the population as a whole.

Two major factors to be derived from the foregoing information form the basis for the present invention. One is the need and intent in today's society of the civilian population to be able to defend itself in time of need with the use of hand guns; the other is the need to achieve a significant reduction in the number of injuries and deaths resulting from the use of these guns. Various measures have been tried and adopted from time to time in an effort to achieve this objective, with varying degrees of success, but thus far no panacea has been found, nor is it likely that one exists. However, the present invention is directed principally toward affecting a significant reduction in the number of injuries and deaths resulting from accidental or unintentional discharge of a hand gun from the following common situations, among others: (a) children playing with loaded hand guns which are accessible to them; (b) children committing suicide with hand guns which are directly accessible to them or are obtained from others; (c) unintentional shooting committed in the extreme stress of a highly emotional situation; (d) any shooting carried out with a stolen hand gun; and (e) any other situation where a shooting could have been prevented by rendering the gun inoperable and useless by anyone but the authorized owner or user.

## 2. Background Technology

It has been generally recognized among gun safety specialists that the concept of hand gun safety is inversely related to the concept of hand gun utility. In other words, a totally safe hand gun, utilizing existing devices, is a totally useless one, and a readily useful hand gun is one totally lacking in safety. For example, the pistol lying on the night table, loaded and cocked is 100% useful and 0% safe, in terms of accidental, inadvertent or unauthorized use of the weapon. Conversely, the same pistol locked in a display case with no ammunition available is 0% useful in a moment of need but 100% safe. It is axiomatic that as gun safety technology gradually implements systems and devices for rendering a hand gun more readily useful in a given situation, the degree of safety of the gun in that situation decreases in proportion to the increased degree of utility. Thus, the principal problem facing hand gun safety specialists is to develop and apply technology directed toward generating an optimal relationship of improved gun safety and effective gun utility.

Firearm safety devices have long been well known, having evolved for over a century from simple mechanical trigger obstructions to rather sophisticated built-in firing mechanism locking devices, as well as to external devices designed to be attached to a hand gun, preventing it from being operated in an unintended manner. In this latter category, to which the present invention relates, various types of gun safety devices have been designed and developed, and the prior art is replete with examples which have served the purpose of safety to one degree or another, but have in return hampered the utility of the gun by an authorized user. Despite the commercial availability of gun safety devices, they are not generally utilized by those individuals who obtain a hand gun for protection because they impede instant use of the gun and therefore detract from the high degree of utility which owners require. Consequently, many accidental and unintentional wounding and deaths continue to occur throughout the United States because the current gun safety devices do not adequately address the aforementioned safety/utility relationship.

For example, one type of gun lock device commercially

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Full Text Help

Go to Page:

Go



Sections:

- Front Page
- Drawings
- Specifications
- Claims

available manual access to the trigger guard of the gun and  
picked without great difficulty, the lock can be easily drilled  
out since there is no built in "fail-safe" feature, and the  
installation of such a device on a loaded gun could easily  
cause an accidental discharge. Also, the utility of a gun  
employing this type of device is greatly diminished because  
of the necessity for a hidden key and the concomitant  
activity of the user in finding the key, operating the lock,  
finding ammunition, loading the gun and responding to an  
emergency situation during times of extreme emotional  
stress.  
Another type of gun lock device is a cable which is passed  
down the muzzle end of the barrel of the gun and out through  
the rear of the revolver barrel or the pistol firing chamber.  
The ends of the cable are then locked together with either a  
key or a combination lock. The key lock suffers from most  
of the drawbacks cited with the previous device, and in both  
cases the utility of the gun is significantly diminished.  
Still another form of gun lock device is one of several  
types of dummy rounds which fit in a revolver cylinder, or  
a pistol firing chamber, and are either mechanically or  
explosively actuated to jam in the cylinder chamber or firing  
chamber if an attempt is made to operate the gun in the  
normal manner, thereby rendering the gun inoperable until  
an individual with significant gunsmith skills removes the  
jammed dummy round. Although this device can be installed  
on a loaded gun, thereby enhancing the utility aspect, it can  
generally be easily removed from the gun by an unautho-  
rized person if he or she takes the trouble to examine the gun  
before firing it. Further, it is difficult to ensure safe operation  
since the activation of the dummy round depends upon the  
particular motions of the person using the weapon. Location  
of multiple dummy rounds in various firing positions would  
be required to ensure that a jamming action could occur.  
Further, at a time of high stress the legitimate operator may  
not be able to recall the particular sequence of the dummy  
round(s) and inadvertently jam his defensive protection  
when he or she is in most need of it.  
One of the most common forms of gun lock devices to be  
found in the prior art is a rigid device which is inserted down  
the barrel of the gun and is locked therein by a suitable means  
so that it cannot be removed except by an authorized person  
who knows how to unlock the device. Generally, these  
devices fall into one of two categories, one being a rod  
which extends through the barrel and into the revolver  
cylinder chamber or pistol firing chamber and which  
includes some way of locking the device to the muzzle end  
of the barrel, thereby preventing rotation of the revolver  
around the barrel, and which includes some form of  
locking device to prevent removal of the device from the gun  
the pistol firing chamber, and which includes some form of  
form of dummy round in the revolver cylinder chamber or  
other category is the type of rod which connects to some  
cylinder or operation of the pistol firing mechanism. The  
locking device to prevent removal of the device from the gun  
a loaded gun since the installation of the device does not  
involve the use of ammunition in either the operable firing  
chamber of the revolver or the firing chamber of the pistol,  
thereby enhancing the utility of the gun. However, the  
current design suffers from the disadvantages that it can  
easily be accidentally discharged during removal of the  
device from the gun, it may not work on existing guns, and  
the device can be removed from the gun by an unauthorized  
person, allowing the safety integrity of these devices to be

defeated without great difficulty if one has common tools  
and skills, or can exert sufficient force to extract the rod from  
the barrel. Therefore, the major drawback of these devices at  
the present time is that while the degree of utility of the gun  
is enhanced, the degree of safety from accidental or inad-  
vertent wounding is correspondingly low.  
**SUMMARY OF THE INVENTION**  
The gun lock device of the present invention overcomes, and  
in many cases, eliminates the disadvantages of the prior art  
gun lock devices discussed above, yet retains the advantages  
thereof. As will be seen in detail hereinafter, the gun lock  
device of the present invention breaks the inverse relationship of  
the degree of safety accompanied by a high degree of utility.  
To this end, the gun lock device of the present invention,  
which is adapted for use with either a revolver or automatic  
pistol type hand gun for rendering the gun inoperable by an  
unauthorized person regardless of whether the gun is loaded  
or unloaded, comprises broadly a dummy round having the  
same general bullet-like configuration and dimensions of a  
round of live ammunition used in a particular gun, so that the  
dummy round fits within a cylinder chamber of a revolver or  
the firing chamber of a pistol. The device includes an  
elongate tube having an outside diameter slightly less than  
the calibre of the bore of the gun so that the tube is manually  
insertable into the muzzle end of the barrel of the gun, the  
tube extending from a point adjacent the inner end of the  
barrel outwardly beyond the muzzle end of the barrel. An  
elongate rod is mounted in the tube and extends from the  
inner end of the tube outwardly beyond the outer end of the  
tube. A gripping means is disposed on the inner end of the  
rod for alienatingly gripping and releasing the forward end of  
the dummy round. An actuating means is mounted on and  
interconnected between the outer end of the rod and the  
outer end of the tube for causing limited axial relative  
movement between the rod and the tube between a first  
position in which the gripping means is disposed within the  
tube for gripping the forward end of the dummy round and  
a second position in which the gripping means extends  
beyond the tube for releasing the forward end of the dummy  
round. Finally, there is a locking means operatively associ-  
ated with the actuating means for alienatingly permitting  
preventing operation of the actuating means, so that when  
the gripping means is gripping the dummy round and the  
actuating means is locked against operation, the locking  
device cannot be removed from the barrel of the gun, which  
is thereby rendered inoperable.  
In some of the more specific aspects, the dummy round of  
the present invention is absolutely fail safe from the stand-  
point that if any attempt is made to defeat the high degree of  
security of the gun lock device by forcibly removing the  
assembly which is inserted down the barrel of the gun, the  
dummy round expands both axially and radially and thereby  
becomes so tightly wedged in the inner end of the gun barrel  
that it cannot be removed except with the use of tools  
typically utilized by gun gunsmiths. In addition, it is sufficient  
force is applied, such as that beyond normal manual force,  
a portion of the dummy round is designed to break off and  
leave the remainder firmly wedged in the barrel of the gun,  
thereby permitting the assembly which is inserted down the  
gun barrel to be removed therefrom while still leaving the  
gun in a totally inoperable condition.  
Means are provided whereby the device can be unlocked  
and removed from a gun solely by tactile perception, without



▲ Full Text  
? Help

Go to Page:


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,475,994

5

the benefit of any visual perception, and in a manner which is entirely silent. In other words, the device can be unlocked and removed from a gun in the dark merely by the operator being able to "feel" certain parts that move relatively to each other and instinctively know when the device is unlocked, and this can be accomplished without any sound. Thus, one could keep his loaded gun in a night table drawer with the gun lock device installed and, should the need arise, remove the gun from the drawer and unlock and remove the gun lock device entirely in the dark and without making any sound.

A significant feature of the invention is that it is ergonomically designed to eliminate the possibility of the owner accidentally discharging the gun while either installing or removing the gun lock device. This is achieved by providing an unlocking and locking procedure which requires the operator to use both hands to hold the gun and operate the locking mechanism, thereby preventing the operator's hands from coming in contact with the trigger.

A uniquely advantageous feature of the present invention resides in the adaptability of the aforementioned locking means to function in a locking device having utility independent and apart from the primary purpose of the locking device of the present invention, that is, in any form of locking device which performs its intended purpose through movement of a mechanical element.

Having thus briefly described the general nature of the present invention, it is a principal object thereof to provide a high security gun lock device which avoids or eliminates the disadvantages of prior art gun lock device and provides advantageous features not heretofore known.

Another object of the present invention is to provide a high security gun lock device which is absolutely fail safe in the sense that any attempt to defeat the security of the device results in the gun being rendered completely useless without the aid of specialized tools and skills, while at the same time retaining a high degree of utility.

A further object of the present invention is to provide a gun lock device which can be operated entirely by tactile perception, without the aid of visual perception, and which can be so operated without the gun lock device emitting any sound, so that the gun lock device can be unlocked and removed from the gun in the dark and without any audible warning that this is being accomplished.

A still further object of the present invention is provide a gun lock device in which the locking means thereof has independent utility which renders it operable in any form of locking device capable of performing its intended function through a simple mechanical movement.

Other significant objects of the present invention are to provide a gun lock device which can be removed very quickly and easily, can be used with all sizes of hand guns, requires no modification of the gun and is economical to obtain and maintain.

These and other objects and advantages of the present invention will be more apparent from an understanding of the following detailed description of a presently preferred embodiment of the invention, when considered in conjunction with the accompanying drawings which show details of the invention as described below.

#### DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side, partially section, view of a common form of revolver showing the gun lock device of the present invention installed therein.

6

FIG. 2 is a view similar to FIG. 1 showing a common form of automatic pistol showing the gun lock device of the present invention installed therein.

FIG. 3 is a side view of the gun lock device of the present invention showing the major sub-assemblies of the device as they would appear when not installed in a gun.

FIG. 4 is a longitudinal sectional view of the entire gun lock device installed in the revolver shown in FIG. 1, with the parts shown in the positions they occupy when the device is in a fully locked condition.

FIG. 5 is a view similar to FIG. 4, but showing the parts in the positions they occupy when the device is in an unlocked condition, but still installed in the gun.

FIG. 6 is a perspective, exploded, partially sectional view of the parts of the actuating mechanism and locking mechanism of the gun lock device.

FIG. 7 is a side view of the enhanced dummy round assembly, showing the bullet and the expanding rod removed from the casing to reveal detail.

FIG. 8 is a perspective view of the two halves of the bullet portion of the dummy round shown in FIG. 9.

FIG. 9 is an enlarged, sectional view of the enhanced dummy round installed in a revolver cylinder chamber with the gripping means attached to the head portion of the bullet with the gun lock device in its normal locked condition.

FIG. 10 is a view similar to FIG. 9, but showing the bullet portion of the dummy round partially extracted from the casing and also radially expanded so as to be firmly wedged in the barrel of the gun in response to a pulling force on the gripping and locking portion of the gun lock device in an attempt to remove it from the gun.

FIG. 11 is a view similar to FIGS. 9 and 10, but showing the head portion of the bullet severed from the main body portion as a result of an excessive pulling force applied to the gripping and locking portion of the gun lock device.

FIG. 12 is a perspective view of an operator holding a gun in the recommended position for inserting the gun lock device of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

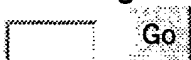
Referring now to the drawings and particularly to FIGS. 1 and 2 thereof, the reference numeral 10 designates generally the gun lock device of the present invention. In FIG. 1, the gun lock device is shown installed in a typical revolver type hand gun, designated generally by the reference numeral 12. As is generally known, a common form of revolver 12 comprises a frame 14, a handgrip 16 connected to the frame 14, a barrel 18 connected to the forward end of the body 14, and a cylinder 20 rotatably mounted in the frame 14. The cylinder is provided with a plurality of chambers 22 for holding rounds of ammunition (not seen in FIG. 1). A trigger 24 is connected to a firing mechanism (not shown) which operates a hammer 26 and causes it to strike the rear end of a round of ammunition held in the cylinder chamber which is in line with the barrel 18, causing the bullet portion of the round to be fired from the barrel 18. In a double acting revolver, operation of the firing mechanism also causes the cylinder 20 to rotate a predetermined amount to bring the next chamber 22 into alignment with the barrel 18 so that the gun is ready to be fired merely by further pressure on the trigger.

In FIG. 2, the gun lock device 10 is shown installed in a typical automatic pistol type hand gun, designated generally



▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,475,994

7

8

by the reference numeral 30. Again as is generally known, the pistol 30 comprises a main frame 32, a hand grip 34 connected to the main frame 32 and containing a magazine for ammunition, an upper frame 35 mounted on the main frame 32 for axial movement with respect thereto. A barrel 36 is held between the main frame 32 and the upper frame 35, and contains the firing chamber 38 adjacent the rear end thereof. A trigger 40 is connected to a firing mechanism (not shown) which operates a hammer 42 and causes it to strike a firing pin 44 located in the rear portion of the upper frame 35 which in turn strikes the rear end of a round of ammunition held in the firing chamber 38, causing the bullet portion of the round to be fired from the barrel 36. High pressure gas from the burning of the gun powder forces the upper frame 35 rearwardly in order to eject the spent cartridge from the firing chamber by an ejecting mechanism, thereby allowing a fresh round of ammunition held in the magazine to be inserted into the firing chamber 38 as the upper frame 35 returns to its normal position. Thus, the gun is ready to be fired immediately after each previous round is discharged.

As best seen in FIG. 3, the gun lock device 10 of the present invention comprises two major components, a gripping and locking assembly designated generally by the reference numeral 50 and a dummy round assembly designated generally by the reference numeral 52. The gripping and locking assembly 50 comprises a hollow tube 54 adapted to be inserted into the muzzle end of the barrels 18 or 36 of the revolver 12 or pistol 30 respectively. A gripping means, designated generally by the reference numeral 56, is mounted on a rod (not seen in FIG. 3) which extends through the tube for gripping the forward end of the dummy round 52 in a manner fully described hereinafter. An actuating mechanism (not seen in FIG. 3) is located within a housing, designated generally by the reference numeral 58, for operating the gripping means 56 to alternately grip and release the forward end of the dummy round 52. Finally, a locking means (not seen in FIG. 3) for the actuating mechanism is located with a forward portion of the housing 58 adjacent to an operating knob, generally designated generally by the reference numeral 60, by which the locking means is operated to alternately prevent and permit operation of the actuating mechanism. The foregoing features of the gripping and locking assembly not seen in FIG. 3 will be fully shown and described hereinafter.

As seen in the right end of FIG. 3, the dummy round 52 has the same general configuration and dimensions of a round of live ammunition used with the particular gun with which the gun lock device is intended for use so that the dummy round 52 fits within the cylinder chamber 22 of the revolver 12 or the firing chamber 38 of the pistol 30 in the same manner as a round of live ammunition. The dummy round 52 comprises a cylindrical casing 62 having a base 64 and a forward rim 66. A bullet 68 is partly confined within the casing 62 and has a bulbous head 70 which defined by a reduced neck 72 adjacent the forward end of the bullet 68.

Referring now to FIG. 4, it will be seen that the gun lock device 10 is installed in the revolver 12; however, the following description of both the construction and operation of the gun lock device 10 would be the same as if the device were installed in the pistol 30. As stated above, the gun lock device 10 comprises the hollow tube 54 which has an outside diameter slightly less than the calibre of the bore of the revolver 18 so that the tube 54 is manually insertable into the muzzle end 74 of the barrel 18. The tube 54 extends from a point adjacent the inner end 76 of the barrel 18 outwardly beyond the muzzle end 74 thereof and terminates in a

radially outwardly projecting flange 77 which bears against a shoulder 79 formed inside the housing 58 adjacent the inner end thereof. The inner end 80 of the tube 54 is also adjacent the forward end of the dummy round 52 when it is positioned in the cylinder chamber 22 of the revolver 12 or the firing chamber 38 of the pistol 30. Thus, the diameter and length of the tube 54 will vary with the type, calibre and size of the gun with which it is intended for use; however, adapters can be provided to ensure that the inner end of the housing 58 fits snugly against the muzzle end of the barrel 18.

An elongate rod 82 is mounted in the tube 54 and extends from a point adjacent the inner end 80 of the tube 54 outwardly beyond the outer end flange 77 of the tube 54. The gripping means 56 comprises a plurality of gripping hooks 84 which are mounted adjacent the inner end 86 of the rod 82 for alternately gripping and releasing the bulbous head 70 of the dummy round 52 as fully described hereinafter. The gripping hooks 84 each have an outwardly curved spring arm 88 which terminates in a reverse direction hook portion 90. The construction and arrangement of the spring arms 88 is such that the gripping hooks are normally biased radially outwardly away from the actuating rod 82 when the gripping hooks are extended beyond the inner end 80 of the tube 54 and are pressed inwardly toward the rod 82 by the inner surface of the tube 54 when the gripping hooks 84 are confined within the inner end 80 of the tube 54 in response to operation of an actuating mechanism to be described hereinafter. A sleeve 92 is mounted inside the tube 54 adjacent the inner end 80 thereof. The sleeve 92 performs two functions; it supports the inner end portion of the rod 82 to ensure that both the inner end portion of the actuating rod 82 and the gripping hooks 84 are centered in the tube 54. Also, by utilizing sleeves 92 of different diameter, it is possible to use the same size gripping hooks 84 and bulbous head 70 on the dummy round 52 regardless of the calibre of the gun with which the gun lock device 10 is used.

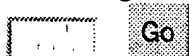
The aforementioned actuating mechanism is mounted on the outer end 94 of the rod 82 and includes and is partly enclosed within the housing 58. The actuating mechanism further comprises a coupler designated generally by the numeral 96 suitably connected at its inner end 97 to the outer end 94 of the rod 82, the coupler 96 having radial flange 98 located at about the center of the coupler 96 which serves as an abutment for a compression spring 100 which is captured between the flange 77 formed on the outer end of the tube 54 and the flange 98 on the coupler 96. The spring 100 normally biases the rod 82 outwardly with respect to the tube 54 which thereby normally maintains the gripping hooks 84 within the inner end 80 of the tube 54. The outer end 99 of the coupler 96 is connected to the inner end 102 of a lock pin 104 which is fixedly connected to an intermediate wall 106 of a cylindrical lock cage designated generally by the numeral 108 by means of a key 105 which fits into a slot 107 formed in a reduced diameter portion 109 of the lock pin 104, thereby locking the lock pin 104 and the lock cage 108 together. The lock cage 108, which is part of a lock mechanism yet to be described, is mounted within the forward portion 110 of the housing 58, and further includes a rear wall 112 against which the outer end 99 of the sleeve 96 bears. The intermediate wall 106 and the rear wall 112 define therebetween a space or channel 116 which receives the legs 118 of an interposer designated generally by the reference numeral 120.

As best seen in FIG. 6, the interposer 120, which forms part of the aforementioned locking mechanism, comprises a serrated finger button 122 disposed on the upper end of an



▲ Full Text  
? Help

Go to Page:



Sections:

- Front Page
- Drawings
- Specifications
- Claims

5,475,994

9

10

upstanding wall 124, which is joined with an elongate body member 126 extending in opposite directions from the upstanding wall 124. The finger button 122 and the inner portion 128 of the body member 126 define therebetween a space 130 which is adapted to receive an upper forward wall portion 132 of the housing 58 behind a slot 133, as best seen in FIGS. 5 and 6, when the interposer 120 is depressed to allow the housing 58 to be moved in a forward direction to cause the gripping hooks 84 to release the bulbous head 70 of the dummy round 52, which operation will be described in more detail hereinafter. The interposer 120 also includes a rib 134 extending along the underside of the body member 126 which interacts with the locking mechanism in the manner described below. The lock cage 108 also includes a wide slot 135 along the upper portion thereof through which the body member 126 of the interposer 120 passes when the interposer 120 is depressed. The interposer 120 is normally biased upwardly by a pair of compression springs 136 captured between the underside of the legs 118 and the bottom of the lock cage 108, in which position the forward end of the inner portion 128 of the body member 126 abuts the outer end of the upper forward wall portion 132 of the housing 58, thereby preventing movement thereof.

From the structure thus far described, it will be seen from a comparison of FIGS. 4 and 5, that when the interposer 120 is in the raised position shown in FIG. 4, the housing 58 is disposed in a rearward position relative to the lock cage 108, and the rear wall 79 of the housing 58 abuts the muzzle end of the barrel 18. In this position, the tube 54 is in a first position in which the gripping hooks 84 are disposed within the inner end 80 of the tube 54 and are gripping the bulbous head 70 of the bullet 68, as seen in FIG. 4. With the parts in this position, the gripping and locking assembly 50 is rigidly connected to the dummy round assembly 52, thereby effectively preventing the revolver cylinder 20 from rotating and the dummy round 52 from being ejected from the firing chamber 38 of the pistol 30. Thus, both the revolver 12 and the pistol 30 are rendered completely inoperable. However, when the interposer 120 is depressed to the position shown in FIG. 5, the housing 58 can then be moved forwardly relative to the lock cage 108, since the upper forward wall portion 132 can be received in the space 130 between the underside of the finger button 122 and the upper surface of the forward portion 128 of the body member 126. When the housing 58 is moved to this position, it pulls the tube 54 forwardly due to the interconnection between the flange 77 on the outer end of the tube 54 and the shoulder 78 on the inner end of the housing 58. In this position, the tube 54 is in a second position in which the gripping hooks 84 are disposed rearwardly beyond the inner end 80 of the tube 54, thereby allowing the spring fingers 88 of the gripping hooks 84 to move the hook portions 90 outwardly so as to release the bulbous head 70 of the bullet 68, as seen in FIGS. 5. This allows the gripping and locking assembly 50 to be removed from the barrel 18 of the gun so that the revolver cylinder 20 can rotate and the dummy round 52 can be ejected from the pistol firing chamber 38, thereby rendering the respective guns operable. This operation will be considered again hereinafter in connection with a description of the overall operation of the invention.

It should be understood that the gun lock device of the present invention is fully operable with a dummy round assembly 52 configured in the manner of a conventional round of live ammunition. In other words, the dummy round 52 need only be a bullet 68 fixedly mounted in a casing 62, but with a bulbous head 70 on the forward end of the bullet, substantially as shown in FIG. 3. However, a principal

feature of the present invention resides in the provision of an enhanced dummy round assembly in which a bullet is movably mounted in a casing so that it can be partially extracted therefrom by forcible outward movement of the gripping and locking assembly 50 while it is still attached to the bullet. The purpose of this feature is to render the gun lock device 10 fail safe in that if any attempt is made to forcibly remove the gripping and locking assembly 50 from the gun without properly unlocking it and operating the actuating mechanism to separate it from the dummy round assembly, the bullet is partially extracted from the casing in a manner which radially expands it so that it becomes wedged very tightly in a position in which the bullet is disposed partly in the revolver cylinder chamber or the pistol firing chamber, as the case may be, and partly in the barrel of the respective guns, and cannot thereafter be removed except with tools and procedures such as those employed by a gunsmith.

Thus, with reference to FIGS. 7 through 11, the enhanced dummy round assembly, designated generally by the reference numeral 140 in FIG. 7, comprises a bullet 142 having a reduced neck 144 adjacent the forward end thereof which defines a bulbous head 146, all substantially the same as the dummy round 52 shown in FIG. 3. However, the bullet 142 is formed of two half sections, 142a and 142b, as seen in FIG. 8, which are adapted to fit together when assembled in the casing 148 shown in FIG. 7. As best seen in FIG. 8, each half of the bullet 142 is provided with a channel 150 extending forwardly from the rear end of the bullet and terminating in an enlarged half sphere 151, so that when the two halves 142a and 142b of the bullet 142 are assembled together, the channels 150 form an elongate bore 152 and the half sphere portions 151 form an enlarged chamber 153 at the forward end of the bore 150 (see FIG. 9). The bullet 142 also has an annular recess 154 which is adapted to receive an inwardly bent rim 156 formed on the forward end of the casing 148 when the bullet 142 is fully inserted into the casing 148. The bullet 142 is also provided with a plurality of wedge shaped serrations 158 formed along the rear half of the bullet 142 which are adapted to be engaged sequentially by the inwardly bent rim 156 of the casing 148 as the bullet is extracted from the casing.

As best seen in FIG. 9, the rear end portion 160 of the casing 148 is provided with a base 162 which is somewhat depressed into the casing 148 to provide a recess 164 opening toward the rear end of the casing. An expansion rod 166 having an enlarged head 168 formed on the forward end thereof is rigidly connected to the base 162 by means of a stub shaft 170 which passes through an aperture 172 in the rear wall 162, the outer end of the stub shaft 170 being rolled over in the manner of a rivet to form the retaining head 174. The head 174 is disposed in the recess 164 to ensure that it does not interfere either with rotation of the cylinder 20 of the revolver 12 or operation of the ejecting mechanism of the pistol 30.

From the foregoing construction, and by comparing FIGS. 9 and 10, it will be seen that an excessive outward pulling force exerted on the gripping and locking assembly 50, without the gripping hooks 84 having been disengaged from the bulbous head 146 of the bullet 142, will cause the bullet 142 to move outwardly with respect to the casing 148. However, due to the retaining head 174 bearing on the base 162 of the casing 148, the expansion rod 166 cannot move, as a result of which the enlarged head 168 on the expansion rod 166 enters the bore 152, thereby forcing the two halves 142a and 142b of the bullet 142 apart. This radial expansion of the bullet 142 produces two results; one is that as the bullet



▲ Full Text  
? Help

Go to Page:


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,475,994

11

12

moves forwardly from the position shown in FIG. 9 to that shown in FIG. 10, the inwardly bent rim 156 on the forward end of the casing 148 enters one of the wedge shaped depressions 158 on the outer surface of the bullet 142, depending on how far the bullet 142 is moved forwardly, thereby preventing any reverse movement of the bullet 142 and positively locking it in the partially extracted position. Also, radial expansion of the bullet 142 causes the surrounding casing 148 to be firmly wedged in the cylinder chamber 22 or the firing chamber 38 of the revolver 12 or pistol 30. The combined action of the partial extraction of the bullet 142 from the casing 148 and the radial expansion of the bullet 142 and the casing 148 renders the gun not only inoperable but also totally useless to anyone, particularly a gun thief, since the bullet 142 must now be removed by an experienced gunsmith in order to render it operable.

There is a still further safety feature to the enhanced dummy round 140, which is illustrated in FIG. 11. In the event that an unauthorized person attempts to exert such excessive outward pulling force on the gripping and locking assembly 50 as to attempt to pull the enhanced dummy round 140 out of the gun, casing and all, the reduced neck 144 of the bullet 142 is designed to break and sever the bulbous head 146 from the rest of the bullet 142 before the stub shaft 170 breaks. This allows the gripping and locking assembly 50 to be removed from the barrel 18 of the gun and leave the enhanced dummy round 140 wedged in the gun in the manner described above. Thus, it will be appreciated that the features of the enhanced dummy round 140 render the gun lock device 10 totally fail safe against any attempt to defeat the high security thereof.

As briefly stated in the Summary of the Invention, the gun lock device of the present invention is provided with a locking means which affords the user certain advantageous features not found in prior art gun lock devices. In particular, the gun lock device can be removed from the gun on which it is installed entirely in the dark and without any audible signal that it is being removed because the unlocking operation is performed solely by tactile perception, without the benefit of any visual perception. In addition, the locking means has independent utility apart from the purpose for which it was intended in the gun lock device of the present invention in that it can be used in any form of locking device in which a simple mechanical movement suffices to lock the particular device. These features will be more apparent from the following discussion.

Although a variety of combination lock mechanisms could be utilized without departing from the spirit and scope of the present invention, the preferred embodiment disclosed herein includes a plurality of tumbler elements which are manually settable to predetermined positions in which the interposer 120 can be moved to its depressed position as described above. Thus, with reference to FIGS. 4, 5 and 6, it will be seen that the lock pin 104, which, as was previously stated, is fixedly connected to an intermediate wall 106 of the lock cage 108 at the reduced shoulder 105, has an elongate slot 180 in the uppermost portion thereof which extends along the wider diameter portion of the lock pin 104. A plurality of lock tumblers 182, in the form of disks having central apertures 184, are mounted on the wider diameter portion of the lock pin 104 and are freely rotatable thereon. The tumblers 182 are separated from each other by a plurality of friction washers 186 which are interposed between the tumblers 182 and are also disposed at either end of the row of lock tumblers 182. Each friction washer 186 is provided with a tab 188 which fits into the slot 180 formed in the lock pin 104, thereby keying each friction washer to

the lock pin 104 to prevent rotation thereof with respect to the lock pin 104. The tumblers 182 and the friction washers 186 are maintained in relatively tight frictional engagement by a compression spring 190 which is captured between the intermediate wall 106 of the lock cage 108 and the innermost of the friction washers 186. Thus, once a tumbler is moved to a certain angular position in the manner described below, it remains in that position notwithstanding rotary movement of the other tumblers. Although as many tumblers 182 as desired may be provided, the number depending on the desired complexity of operation of the combination lock mechanism, the preferred form of the invention includes three tumblers 182 with four friction washers 184 mounted on the lock pin 104.

Each tumbler 182 is provided with a radially outwardly opening slot 192 at some point around its circumference, the purpose of which is to receive the rib 134 on the underside of the body member 126 of the interposer 120 when the slots 192 of the three tumblers are brought into axial alignment in the manner fully described below. Each tumbler 182 is also provided with a pair of small projections 194 and 196 which face forwardly and rearwardly respectively. The location of the slot 192 and the projections 194 and 196 are different for each tumbler 182 in order to establish a unique pattern for operating each individual lock mechanism. For example, as best seen in FIG. 6, the outermost lock tumbler 182, labeled #1, has the slot 192 at about the 1:00 o'clock position, the forward facing projection 194 at the 6:00 o'clock position and the rearwardly facing projection 196 at about the 11:00 o'clock position. The next lock tumbler 182, labeled #2, has the slot 192 at about the 12:00 o'clock position, the forwardly facing projection 194 at about the 2:00 o'clock position and the rearwardly facing projection 196 at about the 7:00 o'clock position. The innermost lock tumbler 182, labeled #3, has the slot 192 at about the 7:00 o'clock position, with the forwardly facing projection 194 at the 3:00 o'clock position and the rearwardly facing projection 196 at about the 11:00 o'clock position. It should be understood that the foregoing arrangement is entirely arbitrary and can be varied almost indefinitely so that no two gun lock devices can be operated identically to unlock them. If desired, the slots 192 for any two or all three of the tumblers 182 could be the same in order to include combinations of 111, 11-, 1-1 and -11 through 999, 99-, 9-9 and -99.

Means are provided for rotating the tumblers 182 from the random positions shown in FIG. 6 to a position in which the slots 192 of all of the tumblers 182 are axially aligned in an uppermost position so as to receive the rib 134 on the interposer 120. As best seen in FIGS. 4, 5 and 6, this is accomplished by manual rotation of the operating knob 60 which is rotatably mounted on the lock pin 104 and is held thereon by the enlarged head 202. The knob 60 is generally cup shaped with an outermost head portion 204 and in inwardly opening cylindrical portion 206 which surrounds the lock cage 108. The knob 60 has a tapered knurled surface 208 adjacent its outer end by which the knob is grasped for rotating it.

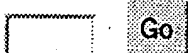
The inner wall of the head portion 204 is provided with a rearwardly facing projection 210 which is similar to the projections 194 and 196 on opposite faces of the tumblers 182. The head portion 202 of the knob 60 is also provided with a plurality of bores 212, each of which contains a small compression spring 214 which presses against a ball 216 captured within the bore 212 in known manner. The balls 216 cooperate with a plurality of detents 216 formed in the outer circular face 219 of the lock cage 108, so that as the knob 60 is rotated relative to the lock cage 108, the balls 216





▲ Full Text  
? Help

Go to Page:



#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

13

and detents 218 provide a plurality of click stops for the knob 60. The construction of the ball and detent arrangement is such that an operator turning the knob 60 can "feel" the balls 216 enter the detents 218; that is, there is sufficient change in the degree of resistance to movement of the knob 60 that the operator knows by tactile perception that the knob has reached one of the click stops, yet the action of the balls entering the detents is virtually silent, at least to normal hearing. Thus, the ball and detent construction provides a virtually silent means for determining digital rotary movement of the knob 60 in increments of less than one full revolution. Finally, the knob 60 also includes a raised projection 220 formed on the outer surface thereof which can be felt by a user of the gun lock device in order to ascertain when the projection 220 and the finger button 122 of the interposer 120 are in alignment. This construction allows the operator to ascertain by tactile perception when the knob 60 has moved through one complete revolution.

The overall operation of the gun lock device 10 will now be described, commencing with preparation of the device for installation on a revolver or pistol as shown in FIGS. 1 and 2. Initially, it is necessary to install either the dummy round 52 or the enhanced dummy round 140 in either an empty chamber 22 in the cylinder 20 of the revolver 12 or the firing chamber 38 of the pistol 30. In the former case, the cylinder 20 is opened in the usual manner and a round of live ammunition is replaced with either type of dummy round and the cylinder is closed with the dummy round aligned with the barrel 18. With the pistol, the magazine is removed from the handgrip 34 and a dummy round is inserted in the top position in the magazine. The magazine is then replaced in the hand grip and the pistol is cocked in the normal manner, thereby inserting the dummy round into the firing chamber 38. The gun is now ready to receive the gripping and locking assembly 50.

Assuming that the tumblers 182 are in the angular position in which the slots 192 in all of the tumblers are in alignment in the uppermost position, the gripping and locking assembly 50 is inserted into the barrels 18 or 36 until the gripping hooks 84 abut the bulbous head 70 of the dummy round 52 or the bulbous head 146 of the enhanced dummy round 140. The interposer 120 can now be depressed against the action of the springs 138 to the position shown in FIG. 5 because the rib 134 will enter the slots 192. In this position, the forward end 128 of the body member 126 does not obstruct outward movement of the upper forward wall portion 132 adjacent the slot 133 of the housing 58. The housing 58 and the knob 60 are pushed toward each with the result that the housing 58 moves outwardly with respect to the barrels 18 or 36 against the force of the spring 100. Outward movement of the housing 58 moves the tube 54 in the same direction because of the cooperative action of the flange 77 on the outer end of the tube 54 and the shoulder 78 adjacent the inner end 79 of the housing 58. The rod 62 is fixed relative to the knob 60, since it is connected through the sleeve 96 to the lock pin 104 which is fixed to the knob 60. Therefore, when the housing 58 and tube 54 move outwardly, the rod 82 remains stationary when the tube 54 moves outwardly, thereby drawing the inner end 80 of the tube 54 beyond the outermost portion of the curved spring arms 88 of the gripping hooks 84. This allows the spring arms 86 to move radially outwardly so that the hook portions 90 of the gripping hooks 84 can pass over the bulbous head 70 of the dummy round 52 or 146 of the enhanced dummy round 140 in response to further inward movement of the entire gripping and locking assembly 50, thereby placing the hook portions 90 in the innermost position as shown in FIG.

5,475,994

14

5. With the parts in this position, the operator allows the spring 100 to move the housing 56 inwardly relative to the barrels 16 or 36, thereby moving the tube 54 and the rod 62 relative to each other so that the inner end of the tube 54 moves over the outermost portion of the curved spring fingers 66 of the gripping hooks 84 so that the hook portions 90 move radially inwardly to the position shown in FIG. 4, thereby firmly gripping the bulbous head 70 or 146 to prevent removal of the gripping and locking assembly 50 from the barrel 18 or 36.

When the housing 58 reaches the innermost position under the force of the spring 100, the upper forward wall portion 132 of the housing 58 clears the upper surface of the forward portion 128 of the body member 126 so that the upper forward wall portion 132 is aligned with the space 130 between the forward portion 128 and the underside of the finger button 122, thereby allowing the interposer 120 to move upwardly under the force of the springs 138 to the position shown in FIG. 4. When the interposer 120 moves to this position, the rib 134 is withdrawn from the slots 192 in the tumblers 182 so that the tumblers can be rotated by the knob 60 to other positions in which the slots 192 are not aligned, thereby preventing downward movement of the interposer 120 and effectively locking the gripping and locking assembly 50 in the barrel 18 or 36.

In order to unlock the gripping and locking assembly 50 for removal from the barrel 18 or 36, it is necessary to again rotate the tumblers 182 so as to align the slots 192 to receive the rib 134 on the interposer 120. Two of the unique features of the gun lock device 10 becomes apparent in connection with performing the following sequence of movements. First, with reference to FIG. 12, and assuming for the purpose of explanation that the operator is right handed, he would normally grasp the gun with the barrel 18 or the upper frame 37, depending on the type of gun involved (the pistol 30 being shown in FIG. 12), and the housing 58 of the gun lock device 10 in his left hand, but with his thumb resting on both the finger button 122 and the projection 220 on the upper inner surface 206 of the knob 60. The operator grasps the knurled surface 208 of the knob 60 with his right hand in order to rotate the knob 60 to operate the locking mechanism. It is immediately apparent from the position of the operator's hands in FIG. 12 that the gun lock device 10 is ergonomically designed to be operated in a manner which makes it virtually impossible for the operator to accidentally contact the trigger 40 during the unlocking procedure described below, thereby rendering the gun lock device absolutely safe, even when operated in the dark in the manner described below.

Again looking at FIG. 12, after the gun and the gun lock device have been grasped in the recommended manner, the operator rotates the knob 60 in a clockwise direction relative to the housing 58, turning the knob 60 through three full revolutions. At this point, another unique feature of the invention becomes apparent in that, although this operation can obviously be performed in full view of the operator, it can also be performed in the dark due to the tactile perception from the projection 220 each time the projection 220 passes adjacent the finger button 122 which, for ease of further explanation, will be hereafter referred to as the "0" position, since each full revolution of the knob 60 causes the projection 220 to pass under the operator's right thumb, which he can feel. The reason for the initial three revolutions of the knob 60 is to cause the inwardly facing projection 210 on the inner wall of the lock cage 108 to engage the outwardly facing projection 194 on the #1 tumbler 182, thereby rotating this tumbler, and thereafter to cause the

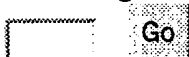
Patent Number: 05475994

Section: Claims 14 of 15 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,475,994

15

inwardly facing projections 196 on the #1 and #2 tumblers 182 to engage the outwardly facing projections 194 on the #2 and #3 tumblers 182 respectively, thereby rotating these lock tumblers, so that all of the projections 210, 194 and 196 are in contact with each other. The combination lock mechanism is now ready to be operated to an unlocked condition.

Commeencing with the parts in these positions, further clockwise rotation of the knob 60 past the 0 position by a first predetermined number of clicks will bring the slot 192 on the #3 tumbler to the uppermost position. The knob 60 is now rotated in a counterclockwise direction two full revolutions, as indicated by tactile perception of the projection 220, plus a second predetermined number of click stops past the 0 position. After the first complete revolution, the inwardly facing projection 210 on the knob 60 has moved to the opposite side of the outwardly facing projection 194 on the #1 tumbler and can now rotate this lock tumbler in a counterclockwise direction until the inwardly facing projection 196 on the #1 tumbler contacts the opposite side of the outwardly facing projection 194 on the #2 tumbler. Further rotation of the knob 60 past the 0 position in the counterclockwise direction by the aforesaid second predetermined number of click stops will bring the slot 192 on the #2 tumbler to the uppermost position, and in alignment with the slot 192 on the #3 tumbler. Finally, the knob 60 is rotated in a clockwise direction one full revolution, as indicated by tactile perception of the projection 220, plus a third predetermined number of clicks past the 0 position. After the complete revolution, the inwardly facing projection 210 on the knob 60 has again moved to the opposite side of the outwardly facing projection 194 on the #1 tumbler. Further rotation of the knob 60 by the aforesaid third predetermined number of click stops will bring the slot 192 of the #1 tumbler 182 to the uppermost position and in alignment with the slots 192 on the #2 and #3 tumblers. At this point, all of the slots 192 are aligned and in position to receive the rib 134 on the interposer 120, which can now be depressed allowing the housing 58 to again be moved outwardly relative to the gun barrel 18 or 36; This will cause the gripping hooks 84 to release the bulbous head 70 or 140 in the manner described above, and the unlocking procedure is complete, allowing the gripping and locking assembly 50 to be removed from the gun barrel. The gun is now ready for operation in the normal manner.

Reference has previously been made herein to the fact that the locking mechanism including the feature of being operable solely by tactile perception of relatively movable parts has independent utility apart from the intended purpose of this mechanism in the gun lock device 10 of the present invention. It should be apparent from the foregoing description that the locking mechanism can be utilized in any form of a lock device in which some form of security device can be put into a locked condition merely by mechanical movement of a part, the movement of which is controlled by the locking mechanism described above. For example, the tube 54 and rod 82 can be connected at the remote end of these parts the aforementioned lock device in which the relative movement between these two parts is effective to lock the device. Thus, it is believed that this assembly constitutes an independent invention apart from the utility of this assembly in combination with the other components of the gun lock device 10 as originally contemplated for use in rendering hand guns inoperable.

What we claim and desire to secure by Letters Patent is:

1. A combination lock mechanism adapted to be attached to a device which is capable of being locked to prevent operation of the device, the combination lock mechanism

16

being actuated by elements which have relative movement therebetween which movement can be sensed by tactile perception, said combination lock mechanism comprising:

- A. a generally tubular housing having opposite open ends,
- B. a lock cage mounted within said housing for relative axial movement with respect thereto and extending through one open end thereof,
- C. locking means mounted in said housing and connected to said lock cage for axial movement therewith, said locking means including an actuating element projecting from the other open end of said housing and being movable between a first position in which said actuating element is operable to prevent operation of the device to which said combination lock mechanism is attached, and a second position in which said actuating element is operable to permit operation of the device to which said combination lock mechanism is attached,
- D. an interposer mounted in said lock cage for radial movement between a first position in which said interposer obstructs said axial movement of said actuating element, and a second position in which said interposer permits said axial movement of said actuating element,
- E. a plurality of settable lock tumblers mounted in said lock cage and operable to permit said radial movement of said interposer when said plurality of lock tumblers are set in individual predetermined positions and to obstruct said radial movement of said interposer when any of said lock tumblers is set in any position other than said predetermined position,
- F. actuating means mounted on said lock cage adjacent said one open end of said housing for rotary movement relative thereto for setting said tumblers to said individual predetermined positions, and
- G. tactile perceptive means for providing a tactile indication of whether said combination lock mechanism is in a locked or unlocked condition and of the extent of rotation of said actuating means while said actuating means is setting said plurality of lock tumblers to said individual predetermined positions,

whereby the locked or unlocked condition of said combination lock mechanism can be ascertained and said actuating means can be operated to set said lock tumblers in said individual predetermined positions or to move said lock tumblers from said individual predetermined positions to permit said combination lock mechanism to be unlocked and locked, both solely by tactile perception.

2. A combination lock mechanism as set forth in claim 1 wherein said tactile perceptive means comprises

- A. first tactile perceptive means operatively interconnected between said lock tumblers and said interposer for indicating whether said combination lock mechanism is in a locked or unlocked condition, and
- B. second tactile perceptive means operatively interconnected between said actuating means and said interposer, and said actuating means and said lock cage respectively for indicating both complete revolutions of said actuating means past a fixed predetermined position, and digital increments of movement of said actuating means less than one complete revolution in either direction of rotation from said fixed predetermined position.

3. A combination lock mechanism as set forth in claim 2 wherein said first tactile perceptive means for providing a tactile indication of whether said combination lock mechanism is in a locked or unlocked condition comprises

Patent Number: 05475994

Section: Claims 15 of 15 pages

[Help](#)

▲ **Full Text**  
 ? **Help**

Go to Page:

 
**Sections:**

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,475,994

17

A. a radial recess formed adjacent the periphery of each of said lock tumblers, and

B. an axial projection on said interposer which enters the radial recesses on said lock tumblers when said lock tumblers are in said individual predetermined positions, whereby said radial movement of said interposer from said first position to said second position indicates that said combination lock mechanism is in an unlocked condition, and said radial movement of said interposer from said second position to said first position indicates that said combination lock mechanism is in a locked condition.

4. A combination lock mechanism as set forth in claim 2 wherein said second tactile perceptive means for ascertaining both complete revolutions and digital increments of rotation less than one complete revolution of said actuating means comprises:

A. a first tactile perceptive element disposed in a fixed predetermined position on said interposer, and a second tactile perceptive element disposed in a fixed predetermined position on said actuating means in which said second tactile perceptive element passes closely adjacent to said first tactile perceptive element during rotary movement of said actuating means when said interposer is in said first position such that an operator can sense by tactile perception when said first and second tactile perceptive elements are in alignment during rotation of said actuating means, and

B. means operatively interconnected between said actuating means and said lock cage for producing tactile perception of intermittent movement of said actuating

18

means relative to said lock cage as said actuating means is rotated through a given segment of a revolution around said lock cage.

5. A combination lock mechanism as set forth in claim 4 wherein

A. said first tactile perceptive element comprises a finger button disposed on the radially outer end of said interposer for moving said interposer between said first and second positions, and

B. said second tactile perceptive element comprises a raised projection formed on the outer peripheral surface of said actuating means closely adjacent to said finger button when said interposer is in said first position,

whereby when said actuating means is rotated to set said tumblers, an operator can tell by tactile perception when said first and second tactile perceptive elements are in alignment with each other.

6. A combination lock mechanism as set forth in claim 4 wherein said tactile perceptive means operatively interconnected between said actuating means and said lock cage for producing tactile perception of intermittent movement of said actuating means comprises ball and detent means operatively associated with adjacent faces of said actuating means and said lock cage, whereby said ball and detent means provides a plurality of click stops which an operator can feel during rotary movement of said actuating means relative to said lock cage.

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▲ Full Text  
? Help

Go to Page:

Go



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Patent Number: 05394635

Section: Front Page 1 of 6 pages

[Help](#)



US005394635A

**United States Patent** [19]  
Stuart

[11] Patent Number: **5,394,635**  
[45] Date of Patent: **Mar. 7, 1995**

[54] SAFETY CARTRIDGE

[75] Inventor: John C. Stuart, Peoria, Ariz.

[73] Assignee: Edward J. Krolak, Phoenix, Ariz.

[21] Appl. No.: 12,327

[22] Filed: Feb. 2, 1993

[51] Int. Cl. F41A 17/44

[52] U.S. Cl. 42/70.11; 102/447; 102/529

[58] Field of Search 42/70.11, 70.01, 98; 102/444, 446, 447, 529, 502, 524, 525

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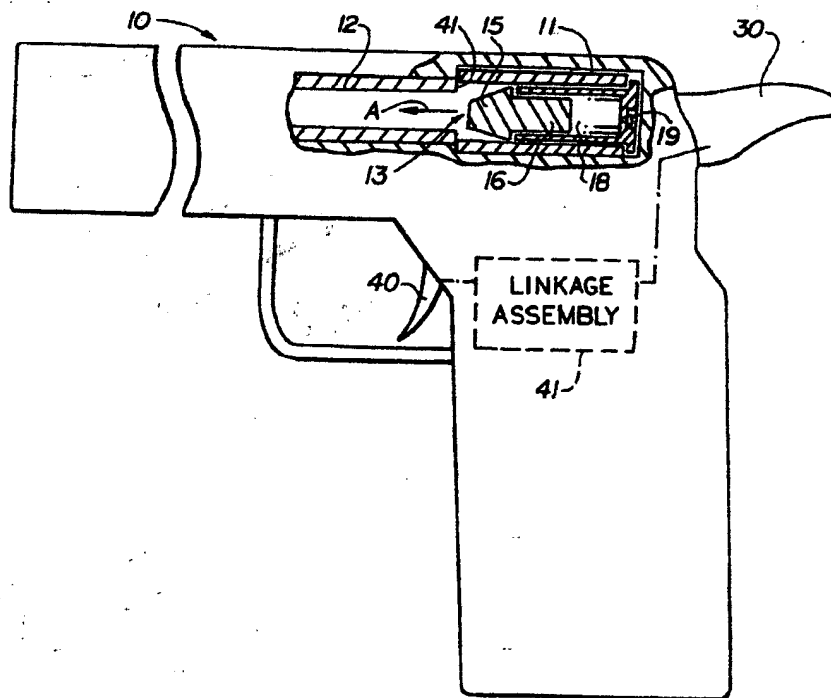
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Primary Examiner—David Brown  
Attorney, Agent, or Firm—Tod R. Nissle

[57] ABSTRACT

A firearm safety cartridge lodges a projectile in the breech end of the barrel of the firearm to prevent live ammunition from being inserted into the firing chamber of the firearm.

3 Claims, 2 Drawing Sheets





U.S. Patent

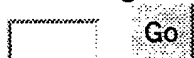
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Sheet 1 of 2

5,394,635

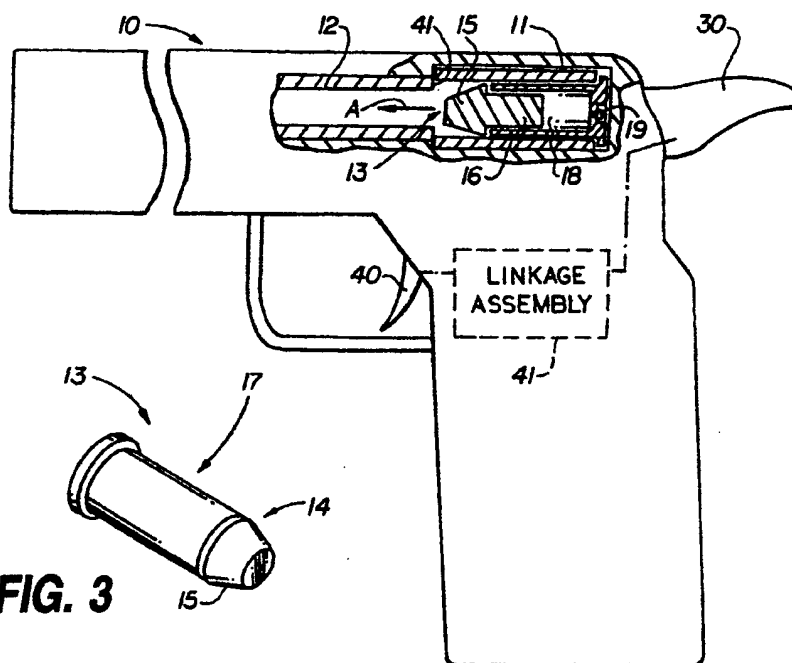
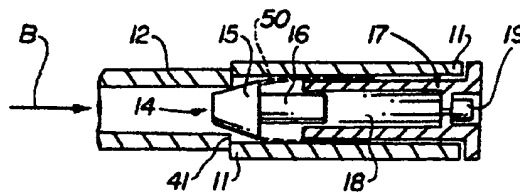
▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

**FIG. 1****FIG. 3****FIG. 2**

Patent Number: 05394635

Section: Drawings 3 of 6 pages

[Help](#)

U.S. Patent

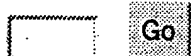
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Sheet 2 of 2

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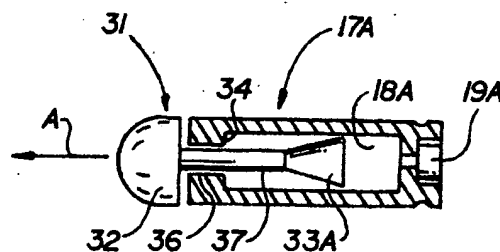
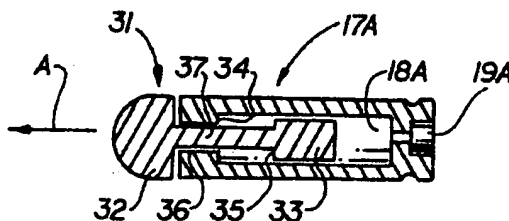
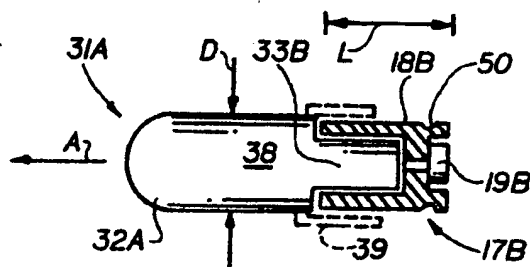
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? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

**FIG. 4****FIG. 5****FIG. 6**



▲ [Full Text](#)  
 ? [Help](#)

Go to Page:


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

1

5,394,635

2

#### SAFETY CARTRIDGE

This invention relates to a safety device for a firearm. More particularly, the invention relates to a firearm safety cartridge which, when fired, lodges a projectile in the breech end of the barrel of the firearm to prevent live ammunition from being inserted in the firing chamber of the firearm.

In another respect, the invention relates to a firearm safety cartridge which lodges a projectile in the breech end of the barrel of the firearm without damaging the barrel.

In a further respect, the invention relates to a firearm safety cartridge which duplicates the appearance of live ammunition and which is readily inserted in the firing chamber of the firearm.

Each year, the accidental discharge of firearms results in serious bodily injury to many people. Even an unloaded firearms cause accidents because children locate the firearm, locate a round of live ammunition, load the round of ammunition into the firing chamber of the firearm, and activate the firing mechanism to discharge the firearm.

Therefore, it would be highly desirable to provide a safety device for a firearm which would significantly reduce the risk that live ammunition could be accidentally discharged in the firearm.

Accordingly, it is a principal object of the invention to provide a safety device for a firearm which prevents the accidental discharge of live ammunition in the firearm.

Another object of the invention is to provide a firearm safety device of the type described which can be readily inserted in and removed from a firearm by an adult but which is difficult for children, particularly young children, to remove from a firearm.

A further object of the invention is to provide a firearm safety device of the type described which will not score or damage either the inner surface of the barrel of the firearm or the firing chamber.

Still another object of the invention is to provide a firearm safety device which is activated when the firing mechanism of a firearm is operated.

These and other, further and more specific objects and advantages of the invention will be apparent to those skilled in the art from the following detailed description thereof, taken in conjunction with the drawings, in which:

FIG. 1 is a partial section view illustrating a firearm provided with a safety cartridge constructed in accordance with the principles of the invention;

FIG. 2 is a partial section view of the safety cartridge of FIG. 1 illustrating the mode of operation thereof;

FIG. 3 is a perspective view illustrating the safety cartridge of FIG. 1;

FIG. 4 is a side section view illustrating an alternate embodiment of the safety cartridge of the invention;

FIG. 5 is a side section view illustrating still another embodiment of the safety cartridge of the invention; and,

FIG. 6 is a side section view illustrating a further embodiment of the safety cartridge of the invention.

Briefly, in accordance with my invention, I provide a safety cartridge for a firearm. The firearm includes a barrel having a breech end; a firing chamber adjacent the breech end of the barrel and in alignment with the barrel; and, a firing mechanism. The safety cartridge is

shaped and dimensioned to be inserted in the firing chamber of the firearm and includes a cartridge case; propellant means mounted in the cartridge case to be ignited by the firing mechanism to form gas in the cartridge case; and, a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the breech end of the barrel when the safety cartridge is in the firing chamber and the propellant means is ignited by the firing mechanism.

In another embodiment of the invention, I provide a safety cartridge in combination with a firearm. The firearm includes a barrel having a breech end; a firing chamber adjacent the breech end of the barrel and in alignment with the barrel; and, a firing mechanism. The safety cartridge is shaped and dimensioned to be inserted in the firing chamber of the firearm and includes a cartridge case; propellant means mounted in the cartridge case to be activated by the firing mechanism; and, a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the breech end of the barrel when the safety cartridge is in the firing chamber and the propellant means is activated.

In still another embodiment of my invention, I provide a safety cartridge for a firearm. The firearm includes a barrel having a breech end; a firing chamber adjacent the breech end of the barrel and in alignment with the barrel; and, a firing mechanism. The safety cartridge is shaped and dimensioned to be inserted in the firing chamber of the firearm and includes a cartridge case; propellant means mounted in the cartridge case to be activated by the firing mechanism; and, a projectile housed in the cartridge case to be propelled toward the breech end of the barrel when the propellant means is activated. The projectile includes a proximate end and a distal end. The projectile and cartridge case are shaped and dimensioned such that when the safety cartridge is in the firing chamber and the propellant means is activated by the firing mechanism, the distal end is displaced away from the cartridge case a selected distance into the breech end of the barrel, and the proximate end remains adjacent a portion of the cartridge case after the distal end is displaced away from the cartridge case into the barrel.

Turning now to the drawings, which depict the presently preferred embodiments of the invention for the purpose of illustrating the practice thereof, and not by way of limitation of the scope of the invention, and in which like reference characters refer to corresponding elements throughout the several views, FIG. 1 illustrates a safety cartridge 13 constructed in accordance with the principles of the invention and in the firing chamber 11 of a firearm 10. Trigger 40 and hammer 30 are interconnected by a conventional linkage assembly, indicated by dashed lines 51 in FIG. 1, which operates hammer 30 when trigger 40 is depressed. The firing chamber 11 is aligned with cylindrical barrel 12 and is adjacent the breech end 41 of barrel 12. The firing mechanism of the firearm includes hammer 30 operated by the trigger 40. The safety cartridge 13 is shaped to be inserted in the firing chamber 11 and includes a hollow cylindrical cartridge case 17 and a projectile 14 mounted in the case 17. Primer 19 is mounted in one end of case 17 and is in communication with hollow cylindrical chamber 18 of case 17. Gun powder can, if desired, be inserted in chamber 18 adjacent primer 19. Projectile 14 includes truncated conical head 15 attached to elongate cylindrical neck 16 slidably received



Patent Number: 05394635

Section: Specifications 5 of 6 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,394,635

3

by chamber 18. FIG. 3 illustrates safety cartridge 13 before cartridge 13 is inserted in chamber 11 and fired.

In use, cartridge 13 is loaded in the firing chamber 11 in the manner illustrated in FIG. 1. The trigger 40 is used to operate hammer 30 in conventional fashion to strike and ignite primer 19 and, if appropriate, to ignite gun powder in chamber 18. When primer 19 and the gun powder ignite, gas is generated which propels projectile in the direction of arrow A in FIG. 1, causing neck 16 to slide along chamber 18 and head 15 to enter end 41 of barrel 12. Conical head 15 is sized such that it lodges and wedges in the breech end 41 of barrel 12 in the manner illustrated in FIG. 2. Head 15 is preferably, but not necessarily, fabricated from a relatively soft resilient polymer or other material which does not damage barrel 12 when head 15 wedges in the breech end 41 of the barrel 12. When head 15 is wedged in end 41 in the manner illustrated in FIG. 2, it is difficult, at best, to remove safety cartridge 13 from firing chamber. In order to remove safety cartridge 13 from chamber 11 20 after the cartridge 13 has been fired, a rod is slid down barrel 12 in the direction of arrow B and pressed against head 15 to force it free from end 41 and cause neck 16 to slide along chamber 18 in the direction of arrow B toward the end of case 17 which housed the primer 19. 25 After the rod has pushed head 15 in the direction of arrow B back against case 17 to the position shown in FIG. 1, the safety cartridge 13 can be removed from firearm 10. The safety cartridge 13 ordinarily will not be fired, but is instead simply loaded into and maintained in the firing chamber 11 of a firearm to protect against the inadvertent discharge of the firearm 10 by a youngster or adult.

An alternate embodiment of the invention is illustrated in FIG. 4 and comprises a cylindrical cartridge case 17A having a cylindrical hollow 18A. Primer 19A is mounted in one end of case 17A and is in communication with hollow 18A. Hollow 18A can, if desired, be charged with gun powder adjacent primer 19A. Projectile 31 includes a distal end 32 shaped to travel through barrel 12. End 32 is of a shape and size that is equivalent to the nose of a bullet found in a round of live ammunition normally used in firearm 10. Consequently, end 32 will freely travel through barrel 12. End 32 is connected to cylindrical neck 37 slidably extending through cylindrical aperture 36 formed in case 17A. Cylindrical piston 33 is connected to neck 37. Piston 33 can slidably move along hollow 18A. Piston 33 includes circular surface 35 which circumscribes neck 37. Case 17A includes circular surface 34 adjacent and circumscribing cylindrical aperture 36. FIG. 4 illustrates cartridge 17A prior to the cartridge 17A being fired. In use, the cartridge of FIG. 4 is loaded in the firing chamber of a firearm with end 32 adjacent the breech end of the barrel. The firing mechanism of the firearm is used to activate primer 19A and, if appropriate, gun powder in hollow 18A adjacent primer 19A. When primer 19A is activated, gas is generated in hollow 18A which propels projectile 31 in the direction of arrow A such that end 32 travels a selected distance into the breech end of the barrel of the firearm. The travel of projectile 31 in the direction of arrow A ceases when surface 35 contacts surface 34. When end 32 is extending into the breech end of the barrel of the firearm, removing the cartridge of FIG. 4 from the firearm is, at best, difficult. The cartridge is removed from the firearm by directing a rod through the open end of the barrel and against end 32 to cause projectile 31 to move in a direction of travel

4

opposite that of arrow A and to slide piston 33 through hollow 18A to move projectile 31 back to the position illustrated in FIG. 4. Once the projectile 31 and case 17A are in the configuration of FIG. 4, the cartridge can be removed from the firing chamber of the firearm.

Still another alternate embodiment of the invention is illustrated in FIG. 5 and comprises a cylindrical cartridge case 17A having a cylindrical hollow 18A. Primer 19A is mounted in one end of case 17A and is in communication with hollow 18A. Hollow 18A can, if desired, be charged with gun powder adjacent primer 19A. Projectile 31 includes a distal end 32 shaped to travel through barrel 12. End 32 is of a shape and size that is equivalent to the nose of a bullet found in a round of live ammunition normally used in firearm 10. Consequently, end 32 will freely travel through barrel 12. End 32 is connected to cylindrical neck 37 slidably extending through cylindrical aperture 36 formed in case 17A. Conical piston 33A is connected to neck 37. Piston 33A can slidably move along hollow 18A. Case 17A includes circular surface 34 adjacent and circumscribing cylindrical aperture 36. FIG. 5 illustrates cartridge 17A prior to the cartridge 17A being fired. In use, the cartridge of FIG. 5 is loaded in the firing chamber of a firearm with the end 32 adjacent the breech end of the barrel, and the firing mechanism of the firearm is used to activate primer 19A and, if appropriate, gun powder in hollow 18A. When primer 19A is activated, gas is generated in hollow 18A which propels projectile 31 in the direction of arrow A such that end 32 travels a selected distance into the breech end of the barrel of the firearm. The travel of projectile 31 in the direction of arrow A ceases when conical piston 33A wedges in aperture 36 in the same manner that head 15 is wedged into end 41 in FIG. 2. When end 32 is in the breech end of the barrel of the firearm, removing the cartridge of FIG. 5 from the firearm is, at best, difficult. The cartridge is removed from the firearm by directing a rod through the open end of the barrel and against end 32 to cause projectile 31 to move in a direction of travel opposite that of arrow A and to slide piston 33A through hollow 18A to move projectile 31 back to the position illustrated in FIG. 5. Once the projectile 31 and case 17A have resumed the configuration of FIG. 5, the cartridge can be removed from the firing chamber of the firearm.

One advantage of the cartridges illustrated in FIGS. 4 and 5 is that they can be readily fabricated to duplicate the exterior shape and appearance of live ammunition which is normally utilized in a firearm.

The safety cartridges illustrated in FIGS. 1 to 5 utilize a primer and, if desired, gun powder to create gas in the cartridge case 17, 17A to propel the projectiles 14, 31, respectively, in a direction outwardly from the case into the breech end of the barrel of the firearm. Pressurized air or any other desired means can be used in place of or in conjunction with the primer and gun powder to propel the projectiles out of the cartridge case.

In the embodiments of the invention illustrated in FIGS. 1 to 5, pistons 33 and 33A and neck 16 slide along a cylindrical hollow in the cartridge case. As would be appreciated by those of skill in the art, a hollow cylindrical sleeve 50 can be substituted for neck 16 and attached to head 15 in the safety cartridge of FIG. 1. The cylindrical sleeve is attached to head 15 and slidably extends over the cylindrical outer surface of the cartridge case 17. When primer 19 is ignited, the cylindrical sleeve slides over case 17 in the direction of arrow A at the same time head 15 moves in the direction of

Patent Number: 05394635

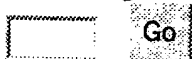
Section: Claims 6 of 6 pages

Help



▲ Full Text  
? Help

Go to Page:



## Sections:

- Front Page
- Drawings
- Specifications
- Claims

5

arrow A. Consequently, the constructing a safety cartridge 13, the cartridge case 17 and projectile 14 can have any shape and dimension provided that the cartridge 13 fits in firing chamber 11, and that head 15 can be displaced a selected distance into the breech end 41 while a neck 16 or other member which is connected to head 15 still extends into or over a portion of case 17.

The safety cartridge illustrated in FIG. 6 is shaped to be inserted in the firing chamber of an automatic colt pistol and includes a hollow cylindrical cartridge case 17B and a projectile 31A mounted in the case 17B. Primer 19B is mounted in one end of case 17B and is in communication with hollow cylindrical chamber 18B of case 17B. Gun powder can, if desired, be inserted in chamber 18B adjacent primer 19B. Projectile 31A includes semi-hemispherical head 32A attached to a cylindrical body 38. The cylindrical body 38 is attached to elongate cylindrical leg 33B slidably received by chamber 18B. FIG. 6 illustrates the safety cartridge before cartridge is inserted in the chamber of an automatic colt pistol and fired. The length L of casing 17B is normally shorter than the length of a conventional casing to insure that when the safety cartridge is fired, the slide of the gun pulls the casing 17B completely off of the projectile 31A, leaving the projectile 31A wedged in the breech end of the barrel and permitting the casing 17B to be cleanly removed or ejected from the gun. As is well known in the art, the slide of the gun engages a portion of circular U-shaped groove 50 on casing 17B and pulls casing 17B away from the breech end of the barrel when the gun is fired.

The outer diameter D of body 38 is presently equal to the outer diameter of casing 17B. The diameter D can, however, be greater or less than the diameter of casing 17B as long as projectile 31A wedges in the breech end of the barrel when the cartridge is fired.

If desired, a projectile 31A, 31, 14 can be shaped and dimensioned such that when the cartridge carrying the projectile is fired, the projectile does not jam in the breech end of the barrel, but instead passes through the breech end of the barrel and jams in the barrel at some other point along the length of the barrel.

If desired, a projectile 31A and casing 17B can each be shaped and dimensioned such that projectile 31A includes a cylindrical sleeve which slides over the outer cylindrical surface of casing 17B or includes one or more outwardly projecting fingers which extend into and slide along a slot which is formed in casing 17B, where the slot is parallel to the direction of travel A of the projectile when the safety cartridge is fired. Other means of mounting a projectile 31A in a casing 17B can also be utilized. In other words, variously shaped projectiles 14, 31, 31A and casings 17, 17A, 17B can be designed as long as the projectile and cartridge contact one another and form a cartridge after being inserted in a gun and as long as the projectiles 14, 21, 31A move in a direction away from casing 17, 17A, 17B and wedge in the barrel of the gun when the cartridge is fired.

5,394,635

6

As used herein the term firearm indicates any weapon that uses gun powder to fire a bullet or shell.

Having described my invention in such terms as to enable those of skill in the art to understand and practice it, and having identified the presently preferred embodiments thereof, I claim:

1. A safety cartridge for a firearm including a barrel having a breech end, a firing chamber adjacent the breech end of the barrel and in alignment with the barrel, and a firing mechanism,

said cartridge being shaped and dimensioned to be inserted in the firing chamber of the firearm and including (a) a cartridge case;

(b) propellant means mounted in said cartridge case to be ignited by said firing mechanism to form gas in the cartridge case; and,

(c) a projectile mounted in the cartridge case and being shaped and dimensioned to be propelled toward and wedge in the barrel when said cartridge is in the firing chamber and the propellant means is ignited by the firing mechanism.

2. In combination with a firearm including a barrel having a breech end, a firing chamber adjacent the breech end of the barrel and in alignment with the barrel, a firing mechanism,

the improvement comprising a safety cartridge, said cartridge being shaped and dimensioned to be inserted in the firing chamber of the firearm and including (a) a cartridge case;

(b) propellant means mounted in said cartridge case to be activated by said firing mechanism; and,

(c) a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the barrel and separate from said cartridge case when said cartridge is in the firing chamber and said propellant means is activated by the firing mechanism.

3. In combination with a firearm including a barrel having a breech end, a firing chamber adjacent the breech end of the barrel and in alignment with the barrel, a firing mechanism,

the improvement comprising a safety cartridge, said cartridge being shaped and dimensioned to be inserted in the firing chamber of the firearm and including (a) a cartridge case;

(b) propellant means mounted in said cartridge case to be activated by said firing mechanism; and,

(c) a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the barrel when said cartridge is in the firing chamber and said propellant means is activated by the firing mechanism, said firing mechanism engaging said cartridge case and displacing said cartridge case away from the barrel after said cartridge is fired.

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60

65



▲ **Full Text**  
? **Help**

Go to Page:


**Sections:**

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 05347739

Section: Front Page 1 of 6 pages

[Help](#)



US005347739A

**United States Patent** [19]  
**Stuart**

[11] Patent Number: **5,347,739**

[45] Date of Patent: **Sep. 20, 1994**

[54] **SAFETY CARTRIDGE**

[75] Inventor: **John C. Stuart, Peoria, Ariz.**

[73] Assignee: **Edward J. Krolak, Phoenix, Ariz.**

[21] Appl. No.: **981,870**

[22] Filed: **Nov. 25, 1992**

[51] Int. Cl.<sup>5</sup> ..... **F41A 17/44**

[52] U.S. Cl. .... **42/70.11; 102/502**

[58] Field of Search ..... **42/70.11, 70.01; 102/444, 446, 447, 529, 502**

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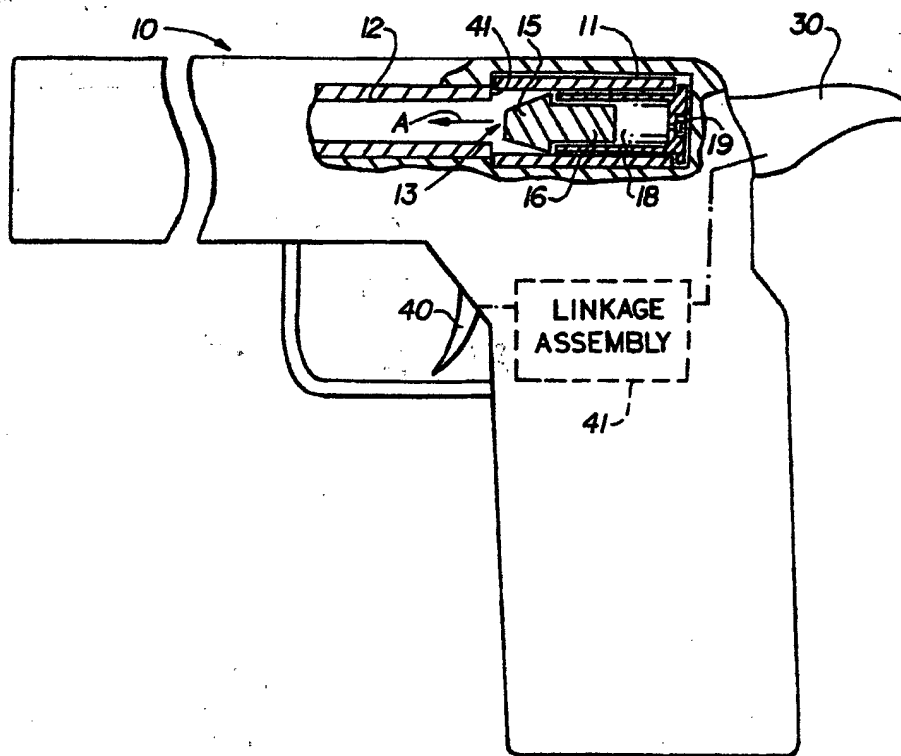
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*Primary Examiner*—David H. Brown  
*Attorney, Agent, or Firm*—Tod R. Nissle

[57] **ABSTRACT**

A firearm safety cartridge lodges a projectile in the breech end of the barrel of the firearm to prevent live ammunition from being inserted into the firing chamber of the firearm.

**4 Claims, 2 Drawing Sheets**





U.S. Patent

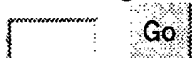
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Sheet 1 of 2

5,347,739

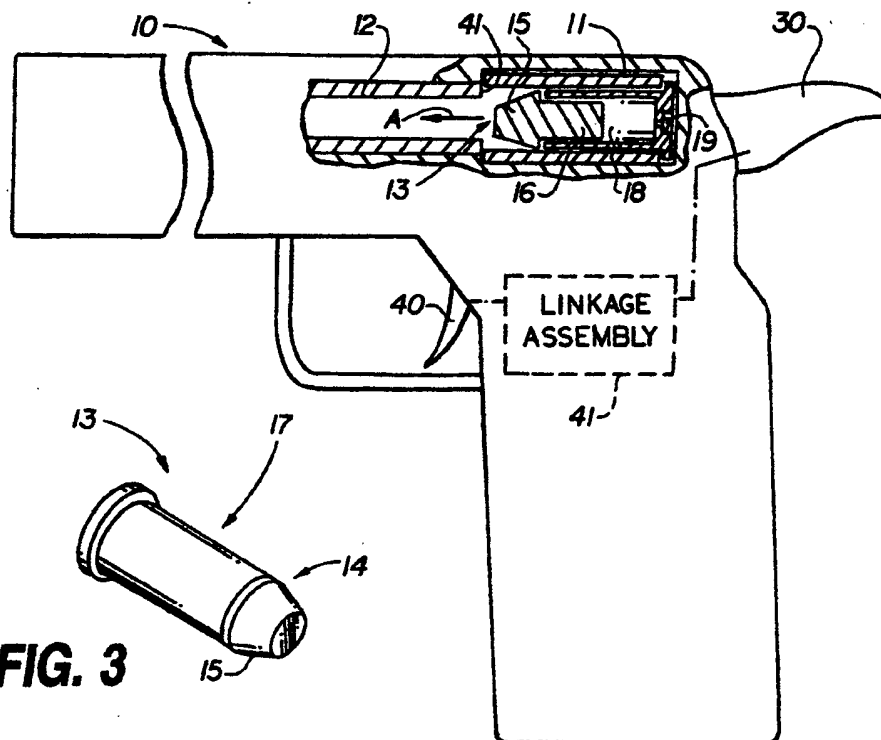
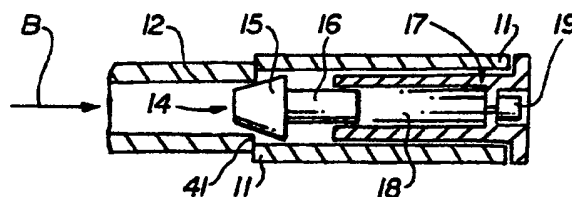
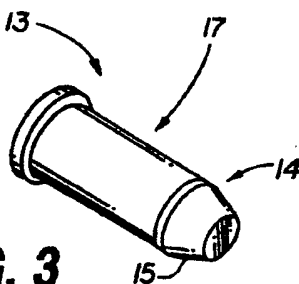
▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

**FIG. 1****FIG. 3****FIG. 2**



Patent Number: 05347739

Section: Drawings 3 of 6 pages

[Help](#)

U.S. Patent

Sep. 20, 1994

Sheet 2 of 2

5,347,739

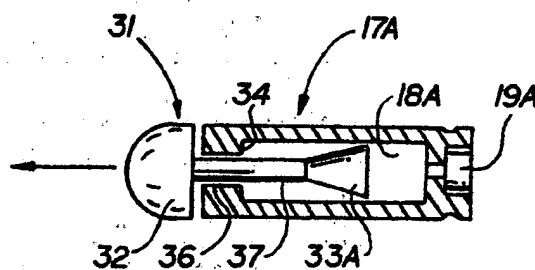
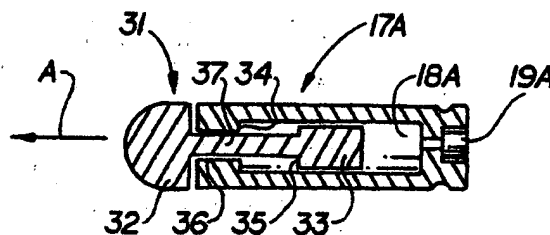
▲ Full Text  
? Help

Go to Page:

 Go

Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

**FIG. 4****FIG. 5**



▲ [Full Text](#)  
? [Help](#)

Go to Page:


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

### SAFETY CARTRIDGE

This invention relates to a safety device for a firearm. More particularly, the invention relates to a firearm safety cartridge which, when fired, lodges a projectile in the breech end of the barrel of the firearm to prevent live ammunition from being inserted in the firing chamber of the firearm.

In another respect, the invention relates to a firearm safety cartridge which lodges a projectile in the breech end of the barrel of the firearm without damaging the barrel.

In a further respect, the invention relates to a firearm safety cartridge which duplicates the appearance of live ammunition and which is readily inserted in the firing chamber of the firearm.

Each year, the accidental discharge of firearms results in serious bodily injury to many people. Even an unloaded firearms cause accidents because children locate the firearm, locate a round of live ammunition, load the round of ammunition into the firing chamber of the firearm, and activate the firing mechanism to discharge the firearm.

Therefore, it would be highly desirable to provide a safety device for a firearm which would significantly reduce the risk that live ammunition could be accidentally discharged in the firearm.

Accordingly, it is a principal object of the invention to provide a safety device for a firearm which prevents the accidental discharge of live ammunition in the firearm.

Another object of the invention is to provide a firearm safety device of the type described which can be readily inserted in and removed from a firearm by an adult but which is difficult for children, particularly young children, to remove from a firearm.

A further object of the invention is to provide a firearm safety device of the type described which will not score or damage either the inner surface of the barrel of the firearm or the firing chamber.

Still another object of the invention is to provide a firearm safety device which is activated when the firing mechanism of a firearm is operated.

These and other, further and more specific objects and advantages of the invention will be apparent to those skilled in the art from the following detailed description thereof, taken in conjunction with the drawings, in which:

FIG. 1 is a partial section view illustrating a firearm provided with a safety cartridge constructed in accordance with the principles of the invention;

FIG. 2 is a partial section view of the safety cartridge of FIG. 1 illustrating the mode of operation thereof;

FIG. 3 is a perspective view illustrating the safety cartridge of FIG. 1;

FIG. 4 is a side section view illustrating an alternate embodiment of the safety cartridge of the invention; and,

FIG. 5 is a side section view illustrating still another embodiment of the safety cartridge of the invention.

Briefly, in accordance with my invention, I provide a safety cartridge for a firearm. The firearm includes a barrel having a breech end; a firing chamber adjacent the breech end of the barrel and in alignment with the barrel; and, a firing mechanism. The safety cartridge is shaped and dimensioned to be inserted in the firing chamber of the firearm and includes a cartridge case;

5,347,739

2

propellant means mounted in the cartridge case to be ignited by the firing mechanism to form gas in the cartridge case; and, a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the breech end of the barrel when the safety cartridge is in the firing chamber and the propellant means is ignited by the firing mechanism.

In another embodiment of the invention, I provide a safety cartridge in combination with a firearm. The firearm includes a barrel having a breech end; a firing chamber adjacent the breech end of the barrel and in alignment with the barrel; and, a firing mechanism. The safety cartridge is shaped and dimensioned to be inserted in the firing chamber of the firearm and includes a cartridge case; propellant means mounted in the cartridge case to be activated by the firing mechanism; and, a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the breech end of the barrel when the safety cartridge is in the firing chamber and the propellant means is activated.

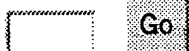
In still another embodiment of my invention, I provide a safety cartridge for a firearm. The firearm includes a barrel having a breech end; a firing chamber adjacent the breech end of the barrel and in alignment with the barrel; and, a firing mechanism. The safety cartridge is shaped and dimensioned to be inserted in the firing chamber of the firearm and includes a cartridge case; propellant means mounted in the cartridge case to be activated by the firing mechanism; and, a projectile housed in the cartridge case to be propelled toward the breech end of the barrel when the propellant means is activated. The projectile includes a proximate end and a distal end. The projectile and cartridge case are shaped and dimensioned such that when the safety cartridge is in the firing chamber and the propellant means is activated by the firing mechanism, the distal end is displaced away from the cartridge case a selected distance into the breech end of the barrel, and the proximate end remains adjacent a portion of the cartridge case after the distal end is displaced away from the cartridge case into the barrel.

Turning now to the drawings, which depict the presently preferred embodiments of the invention for the purpose of illustrating the practice thereof, and not by way of limitation of the scope of the invention, and in which like reference characters refer to corresponding elements throughout the several views, FIG. 1 illustrates a safety cartridge 13 constructed in accordance with the principles of the invention and in the firing chamber 11 of a firearm 10. The firing chamber 11 is aligned with cylindrical barrel 12 and is adjacent the breech end 41 of barrel 12. The firing mechanism of the firearm includes hammer 30 operated by the trigger 40. "Trigger 40 and hammer 30 are interconnected by a conventional linkage assembly, indicated by dashed lines 41 in FIG. 1, which operates hammer 30 when trigger 40 is depressed." The safety cartridge 13 is shaped to be inserted in the firing chamber 11 and includes a hollow cylindrical cartridge case 17 and a projectile 14 mounted in the case 17. Primer 19 is mounted in one end of case 17 and is in communication with hollow cylindrical chamber 18 of case 17. Gun powder can, if desired, be inserted in chamber 18 adjacent primer 19. Projectile 14 includes truncated conical head 15 attached to elongate cylindrical neck 16 slidably received by chamber 18. FIG. 3 illustrates safety



▲ Full Text  
? Help

Go to Page:



#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,347,739

3

cartridge 13 before cartridge 13 is inserted in chamber 11 and fired.

In use, cartridge 13 is loaded in the firing chamber 11 in the manner illustrated in FIG. 1. The trigger 40 is used to operate hammer 30 in conventional fashion to strike and ignite primer 19 and, if appropriate, to ignite gun powder in chamber 18. When primer 19 and the gun powder ignite, gas is generated which propels projectile in the direction of arrow A in FIG. 1, causing neck 16 to slide along chamber 18 and head 15 to enter end 41 of barrel 12. Conical head 15 is sized such that it lodges and wedges in the breech end 41 of barrel 12 in the manner illustrated in FIG. 2. Head 15 is preferably, but not necessarily, fabricated from a relatively soft resilient polymer or other material which does not damage barrel 12 when head 15 wedges in the breech end 41 of the barrel 12. When head 15 is wedged in end 41 in the manner illustrated in FIG. 2, it is difficult, at best, to remove safety cartridge 13 from firing chamber. In order to remove safety cartridge 13 from chamber 11 after the cartridge 13 has been fired, a rod is slid down barrel 12 in the direction of arrow B and pressed against head 15 to force it free from end 14 and cause neck 16 to slide along chamber 18 in the direction of arrow B toward the end of case 17 which housed the primer 19. After the rod has pushed head 15 in the direction of arrow B back against case 17 to the position shown in FIG. 1, the safety cartridge 13 can be removed from firearm 10. The safety cartridge 13 ordinarily will not be fired, but is instead simply loaded into and maintained in the firing chamber 11 of a firearm to protect against the inadvertent discharge of the firearm 10 by a youngster or adult.

An alternate embodiment of the invention is illustrated in FIG. 4 and comprises a cylindrical cartridge case 17A having a cylindrical hollow 18A. Primer 19A is mounted in one end of case 17A and is in communication with hollow 18A. Hollow 18A can, if desired, be charged with gun powder adjacent primer 19A. Projectile 31 includes a distal end 32 shaped to travel through barrel 12. End 32 is of a shape and size that is equivalent to the nose of a bullet found in a round of live ammunition normally used in firearm 10. Consequently, end 32 will freely travel through barrel 12. End 32 is connected to cylindrical neck 37 slidably extending through cylindrical aperture 36 formed in case 17A. Cylindrical piston 33 is connected to neck 37. Piston 33 can slidably move along hollow 18A. Piston 33 includes circular surface 35 which circumscribes neck 37. Case 17A includes circular surface 34 adjacent and circumscribing cylindrical aperture 36. FIG. 4 illustrates cartridge 17A prior to the cartridge 17A being fired. In use, the cartridge of FIG. 4 is loaded in the firing chamber of a firearm with end 32 adjacent the breech end of the barrel. The firing mechanism of the firearm is used to activate primer 19A and, if appropriate, gun powder in hollow 18A adjacent primer 19A. When primer 19A is activated, gas is generated in hollow 18A which propels projectile 31 in the direction of arrow A such that end 32 travels a selected distance into the breech end of the barrel of the firearm. The travel of projectile 31 in the direction of arrow A ceases when surface 35 contacts surface 34. When end 32 is extending into the breech end of the barrel of the firearm, removing the cartridge of FIG. 4 from the firearm is, at best, difficult. The cartridge is removed from the firearm by directing a rod through the open end of the barrel and against end 32 to cause projectile 31 to move in a direction of travel

4

opposite that of arrow A and to slide piston 33 through hollow 18A to move projectile 31 back to the position illustrated in FIG. 4. Once the projectile 31 and case 17A are in the configuration of FIG. 4, the cartridge can be removed from the firing chamber of the firearm.

Still another alternate embodiment of the invention is illustrated in FIG. 5 and comprises a cylindrical cartridge case 17A having a cylindrical hollow 18A. Primer 19A is mounted in one end of case 17A and is in communication with hollow 18A. Hollow 18A can, if desired, be charged with gun powder adjacent primer 19A. Projectile 31 includes a distal end 32 shaped to travel through barrel 12. End 32 is of a shape and size that is equivalent to the nose of a bullet found in a round of live ammunition normally used in firearm 10. Consequently, end 32 will freely travel through barrel 12. End 32 is connected to cylindrical neck 37 slidably extending through cylindrical aperture 36 formed in case 17A. Conical piston 33A is connected to neck 37. Piston 33A can slidably move along hollow 18A. Case 17A includes circular surface 34 adjacent and circumscribing cylindrical aperture 36. FIG. 5 illustrates cartridge 17A prior to the cartridge 17A being fired. In use, the cartridge of FIG. 5 is loaded in the firing chamber of a firearm with the end 32 adjacent the breech end of the barrel, and the firing mechanism of the firearm is used to activate primer 19A and, if appropriate, gun powder in hollow 18A. When primer 19A is activated, gas is generated in hollow 18A which propels projectile 31 in the direction of arrow A such that end 32 travels a selected distance into the breech end of the barrel of the firearm. The travel of projectile 31 in the direction of arrow A ceases when conical piston 33A wedges in aperture 36 in the same manner that head 15 is wedged into end 41 in FIG. 2. When end 32 is in the breech end of the barrel of the firearm, removing the cartridge of FIG. 5 from the firearm is, at best, difficult. The cartridge is removed from the firearm by directing a rod through the open end of the barrel and against end 32 to cause projectile 31 to move in a direction of travel opposite that of arrow A and to slide piston 33A through hollow 18A to move projectile 31 back to the position illustrated in FIG. 5. Once the projectile 31 and case 17A have resumed the configuration of FIG. 5, the cartridge can be removed from the firing chamber of the firearm.

One advantage of the cartridges illustrated in FIGS. 4 and 5 is that they can be readily fabricated to duplicate the exterior shape and appearance of live ammunition which is normally utilized in a firearm.

The safety cartridges illustrated in FIGS. 1 to 5 utilize a primer and, if desired, gun powder to create gas in the cartridge case 17, 17A to propel the projectiles 14, 31, respectively, in a direction outwardly from the case into the breech end of the barrel of the firearm. Pressurized air or any other desired means can be used in place of or in conjunction with the primer and gun powder to propel the projectiles out of the cartridge case.

In the embodiments of the invention illustrated in FIGS. 1 to 5, pistons 33 and 33A and neck 16 slide along a cylindrical hollow in the cartridge case. As would be appreciated by those of skill in the art, a hollow cylindrical sleeve can be substituted for neck 16 and attached to head 15 in the safety cartridge of FIG. 1. The cylindrical sleeve is attached to head 15 and slidably extends over the cylindrical outer surface of the cartridge case 17. When primer 19 is ignited, the cylindrical sleeve slides over case 17 in the direction of arrow A at the same time head 15 moves in the direction of arrow A.

Patent Number: 05347739

Section: Claims 6 of 6 pages

[Help](#)

▲ [Full Text](#)  
? [Help](#)

Go to Page:


## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,347,739

5

Consequently, the constructing a safety cartridge 13, the cartridge case 17 and projectile 14 can have any shape and dimension provided that the cartridge 13 fits in firing chamber 11, and that head 15 can be displaced a selected distance into the breech end 41 while a neck 16 or other member which is connected to head 15 still extends into or over a portion of case 17.

Having described my invention in such terms as to enable those of skill in the art to understand and practice it, and having identified the presently preferred embodiments thereof, I claim:

1. A safety cartridge for a firearm including a barrel having a breech end, a firing chamber adjacent the breech end of the barrel and in alignment with the barrel, and a firing mechanism, said cartridge being shaped and dimensioned to be inserted in the firing chamber of the firearm and including
  - (a) a cartridge case;
  - (b) propellant means mounted in said cartridge case to be ignited by said firing mechanism to form gas in the cartridge case;
  - (c) a projectile mounted in the cartridge case and being shaped and dimensioned to be propelled toward and wedge in the breech end of the barrel when said cartridge is in the firing chamber and the propellant means is ignited by the firing mechanism.
2. In combination with a firearm including a barrel having a breech end, a firing chamber adjacent the breech end of the barrel and in alignment with the barrel, a firing mechanism, the improvement comprising a safety cartridge, said cartridge being shaped and dimensioned to be inserted in the firing chamber of the firearm and including
  - (a) a cartridge case;

6

(b) propellant means mounted in said cartridge case to be activated by said firing mechanism;

(c) a projectile mounted in the cartridge case and shaped and dimensioned to be propelled toward and wedge in the breech end of the barrel when said cartridge is in the firing chamber and said propellant means is activated by the firing mechanism.

3. A safety cartridge for a firearm including a barrel having a breech end, a firing chamber adjacent the breech end of the barrel and in alignment with the barrel, a firing mechanism, said cartridge being shaped and dimensioned to be inserted in the firing chamber of the firearm and including
  - (a) a cartridge case;
  - (b) propellant means mounted in said cartridge case to be activated by said firing mechanism;
  - (c) a projectile housed in the cartridge case to be propelled toward the breech end of the barrel when the propellant means is activated, said projectile including a proximate end and a distal end; said projectile and cartridge case being shaped and dimensioned such that when said cartridge is in the firing chamber and said propellant means is activated by the firing mechanism, said distal end is displaced away from said cartridge case a selected distance into the breech end of the barrel, and said proximate end remains adjacent a portion of said cartridge case after said distal end is displaced away from said cartridge case said selected distance into the barrel.

4. The safety cartridge of claim 3 wherein said proximate end is shaped and dimensioned to wedge in said cartridge case after said distal end is displaced away from said cartridge case said selected distance into the barrel.

\* \* \* \* \*



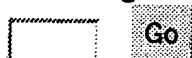
Patent Number: 05171924

Section: Front Page 1 of 10 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:



## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

## United States Patent [19]

Honey et al.



US005171924A

[11] Patent Number: 5,171,924

[45] Date of Patent: Dec. 15, 1992

[54] FLAGGED FIREARM LOCK METHOD AND APPARATUS

[75] Inventors: Michael T. Honey, Boca Raton, Fla.;  
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[21] Appl. No.: 665,529

[22] Filed: Mar. 6, 1991

[51] Int. Cl.<sup>5</sup> ..... F41B 17/44

[52] U.S. Cl. .... 42/70.11; 42/66

[58] Field of Search ..... 42/70.11, 66

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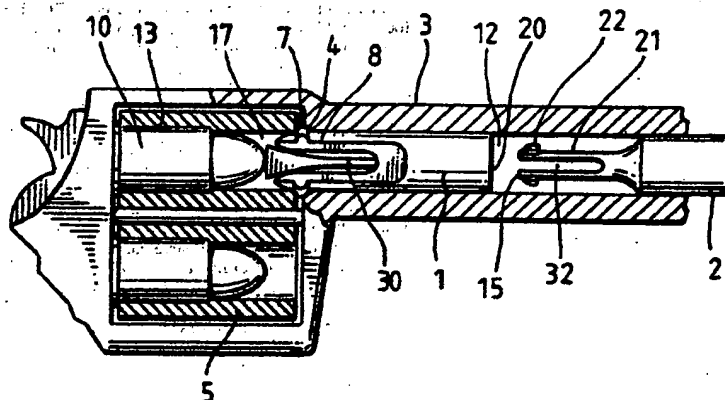
4 Claims, 4 Drawing Sheets

Lock Enterprises, "Unique Lock Protects Children From Gun Accidents".

Primary Examiner—Michael J. Carone

## [57] ABSTRACT

The invention comprises a system for facilitating the locking of a firearm to prevent its unauthorized firing. The system provides an easily noticeable flagging device to facilitate visual affirmation that a firearm lock is engaged; and the firearm cannot be discharged until it has been unlocked. The locking system utilizes a locking wedge that activates a set of locking spurs so as to engage the interior of the firearm and disable the firing mechanism. The system provides for quick and simple enabling of the firearm to facilitate a quick response in an emergency. The system makes use of a locking device that can be inserted or extracted through the barrel of a firearm using a key rod. The locking device is not readily apparent or accessible externally to an observer. The system may be used to lock a firearm that is either loaded or empty, although it is obviously preferable and a proper precaution to apply the system only to empty firearms.



Patent Number: 05171924

Section: Drawings 2 of 10 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:

 Go


Sections:

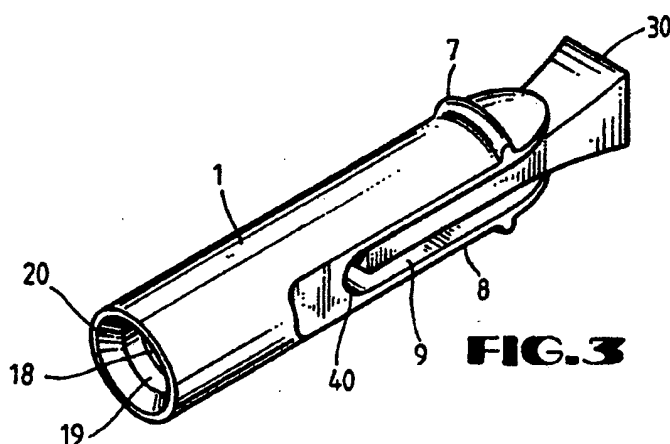
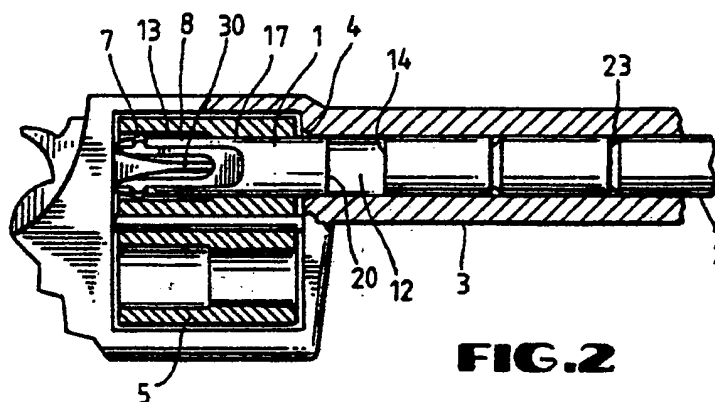
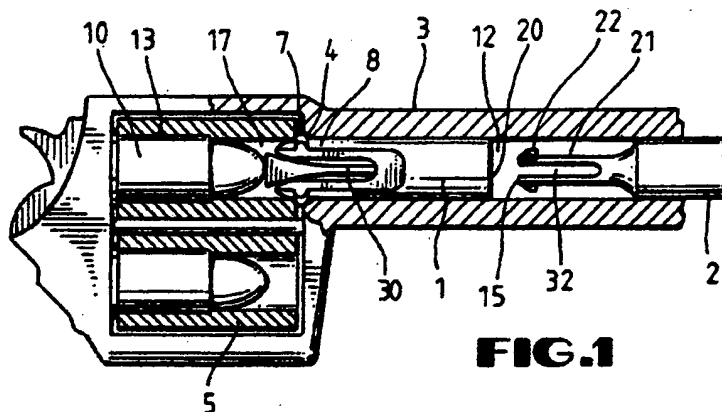
- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

U.S. Patent

Dec. 15, 1992

Sheet 1 of 4

5,171,924





▲ Full Text  
? Help

Go to Page:


Sections:

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 05171924

Section: Front Page 1 of 10 pages

[Help](#)



US005171924A

# United States Patent [19]

Honey et al.

[11] Patent Number: 5,171,924

[45] Date of Patent: Dec. 15, 1992

[54] FLAGGED FIREARM LOCK METHOD AND APPARATUS

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Richard D. Raston, Auburn, N.Y.

[73] Assignee: Aero Finance Group Inc./dba Kiss  
Lock Enterprises, Ft. Lauderdale,  
Fla.

[21] Appl. No.: 665,529

[22] Filed: Mar. 6, 1991

[51] Int. Cl.<sup>5</sup> ..... F41B 17/44

[52] U.S. Cl. .... 42/70.11; 42/66

[58] Field of Search ..... 42/70.11, 66

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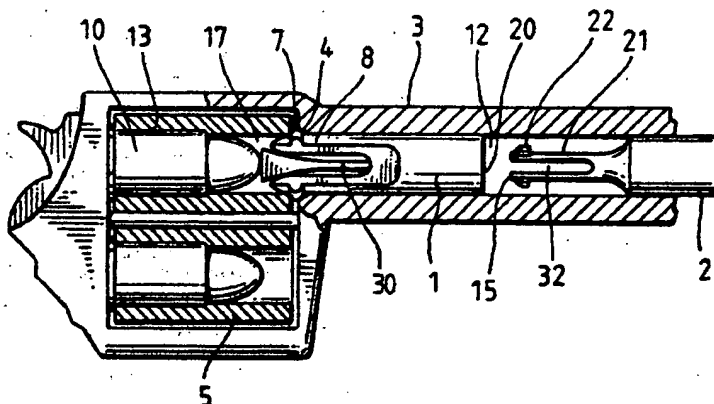
Lock Enterprises, "Unique Lock Protects Children From Gun Accidents".

Primary Examiner—Michael J. Carone

## [57] ABSTRACT

The invention comprises a system for facilitating the locking of a firearm to prevent its unauthorized firing. The system provides an easily noticeable flagging device to facilitate visual affirmation that a firearm lock is engaged; and the firearm cannot be discharged until it has been unlocked. The locking system utilizes a locking wedge that activates a set of locking spurs so as to engage the interior of the firearm and disable the firing mechanism. The system provides for quick and simple enabling of the firearm to facilitate a quick response in an emergency. The system makes use of a locking device that can be inserted or extracted through the barrel of a firearm using a key rod. The locking device is not readily apparent or accessible externally to an observer. The system may be used to lock a firearm that is either loaded or empty, although it is obviously preferable and a proper precaution to apply the system only to empty firearms.

4 Claims, 4 Drawing Sheets



Patent Number: 05171924

Section: Specifications

6 of 10 pages

Help



▲ Full Text  
? Help

Go to Page:

 Go


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

1

## FLAGGED FIREARM LOCK METHOD AND APPARATUS

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The invention relates generally to a system capable of locking firearms so they can not be fired, but also capable of being easily unlocked so as to be rapidly made ready for firing. The invention is especially directed at use in rifles, revolvers, semi-automatic pistols and comparable firearms.

#### 2. Description of the Related Art

Until now a firearm owner has faced the dilemma of leaving a firearm either loaded and ready to use, or else unloaded or locked so as to be not readily accessible. Previous systems of locking firearms may well have prevented the danger of access by unauthorized users or children, but unfortunately they have suffered from a number of shortcomings. In many applications, for example, a firearm safety locking system should be simple to operate but also quickly disengaged to be truly effective. Preferably, it should also be useful with a variety of firearms in both empty and loaded conditions.

Equipment designers, military trainers, police and emergency response groups have established over years of experience that persons under stress in emergency situations suffer greatly diminished coordination and dexterity. Trying to operate cumbersome firearm combination locks or even keyed locks under such conditions can be difficult if not impossible. A firearm should therefore be quickly unlocked and also quickly enabled; otherwise, it may prove useless in an emergency.

On the other hand a firearm locking system should not be easily defeated; otherwise, a firearm can become a risk to children who discover the firearm. It is well known that this risk is especially great when the children are home alone and unsupervised.

A firearm locking system should also make it readily obvious to its owner whether or not the firearm is locked but should not be obvious to others. The firearm lock should not offer an external point of attack. The firearm lock should also not be susceptible to failure and should be capable of locking firearms whether or not they are loaded.

Many safety devices for firearms have been developed which include plugs or locks of various configurations adapted to be installed within the barrel or a chamber so as to prevent loading a round of ammunition into the firearm. Other types of safety devices include a cartridge or thimble secured to a rod, the cartridge being adapted to fit within the firing chamber with the rod extending through the barrel and locked by a locking mechanism. An example of such a device is shown in Parker U.S. Pat. No. 2,327,334, wherein the locking device is shown installed in a revolver. While the Parker installed locking device prevents loading and rotation of the cylinder, it is apparent that the revolver must be of the break action or pivot type since the locking device must be inserted and removed through the rear of the cylinder. Thus, the Parker locking device is not designed for use in rigid frame revolvers in which the cylinder is mounted for pivoting with respect to the revolver frame.

Numerous other examples of firearm locking devices are shown in Finnegan, U.S. Pat. No. 3,336,880, Di Prospero U.S. Pat. No. 3,813,802, Bielman U.S. Pat. No. 4,224,753, Wernicki U.S. Pat. No. 4,398,366, Thur-

5,171,924

2

ber U.S. Pat. No. 4,783,924 and Chaney U.S. Pat. No. 4,908,971. All of these examples, however, are subject to one inconvenience or another. Devices such as Bielman, for example, are externally visible and externally accessible, thereby offering an external point of attack and greatly facilitating the defeat of the locking device.

Other devices can only be used in an empty chamber, thereby reducing the cartridge capacity of a firearm. Many of the devices are also cumbersome and complicated to disengage.

U.S. patent application Ser. No. 07/530,406 filed May 30, 1990, for Grider and assigned to Aero Finance Corporation, Delaware, discloses an easily removable firearm lock that overcomes many of the shortcomings of the prior art. The present invention is an improvement over Grider and the prior art.

### SUMMARY OF THE INVENTION

In general terms, the present invention comprises a locking member and a key member which are inserted into a firearm through its barrel. The key member pushes the locking member such that the leading end of the locking member partially enters a chamber of the firearm. The locking member is preferably designed such that its leading end penetrates into the chamber farther if the chamber is empty, than if the chamber is loaded. In either case, the locking member is configured to grip or otherwise engage the inner wall surface of the bullet path of the firearm—i.e., the wall surface of the chamber (or the barrel) so as to block relative movement between the chamber and the barrel. The firearm's ability to fire is thereby disabled.

The locking member of the present invention is effectively a retractable wall anchor which comprises a body portion whose leading end includes one or more radially and elastically expandable fingers, arms or other gripping or anchor members which expand to engage suitable anchorage points in the wall of the bullet path. The locking member or wall anchor also preferably includes a centrally disposed wedge at its leading end which is configured to engage either the head of a bullet in a chamber, or the back of the chamber itself if no bullet is present in the chamber. The trailing or other end of the wedge is axially movable within the body of the locking member between two axially spaced positions. The leading end of the wedge is the broad end of the wedge and normally protrudes beyond the body and the expandable members. It is preferably broad enough such that the head of a bullet cannot penetrate between the wedge and the wall surface of the chamber.

The trailing end of the wedge tapers inwardly and extends between the expandable anchor members along the axis of the locking member. Thus, telescoping movement of the wedge within the body results in expansion of the expandable elements into an anchoring position against the wall of the bullet path. Preferably, the anchor position is either the forcing cone normally between the chamber and the barrel or else a position deep within the chamber.

The wall anchor members may vary considerably in structure and composition. Flexible tough plastic materials such as Nylon are relatively inexpensive and easy to make, and they have been found to be reliable in service. These materials are also resilient and have good structural memory. Thus, the expandable members of the wall anchor may be fabricated in various shapes, and they will naturally regain these shapes following

Patent Number: 05171924

Section: Drawings 2 of 10 pages

[Help](#)



U.S. Patent

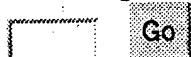
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Sheet 1 of 4

5,171,924

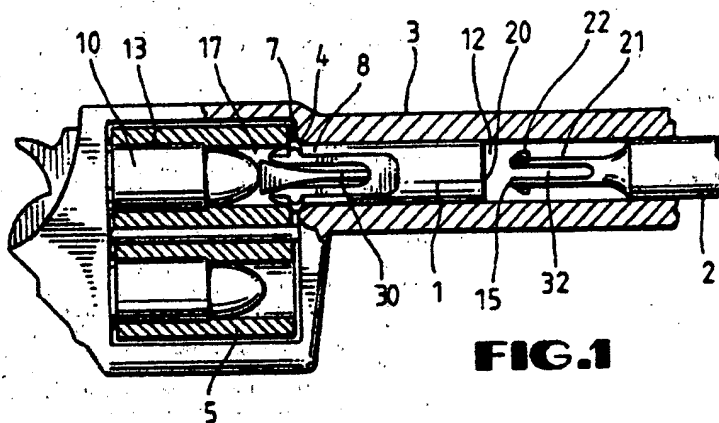
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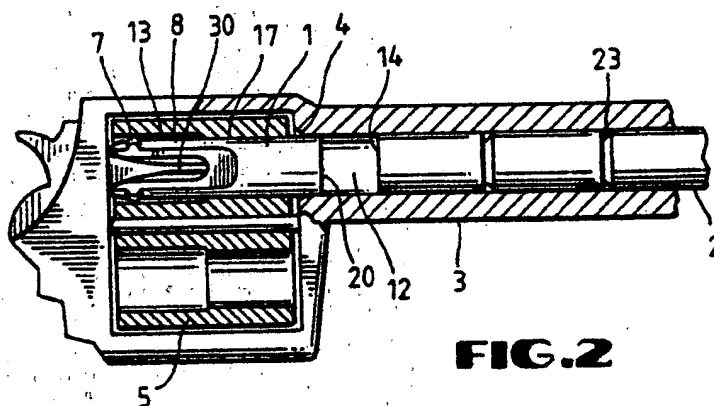


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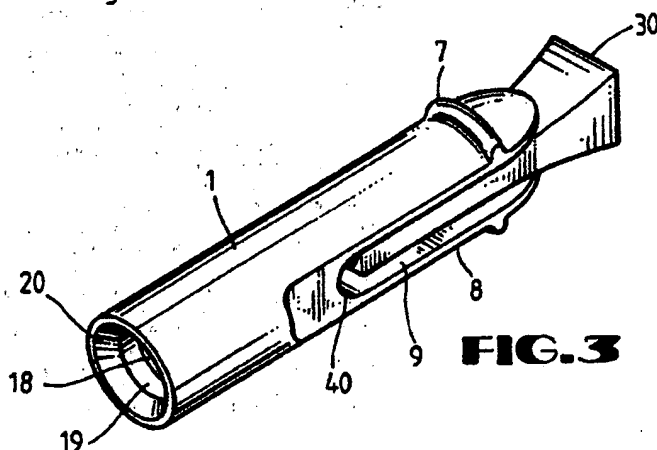
- Front Page
- Drawings
- Specifications
- Claims



**FIG. 1**



**FIG. 2**



**FIG. 3**



▲ Full Text  
? Help

Go to Page:

 Go


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

3

5,171,924

4

distortion. On one embodiment, the expansible members may be shaped to have a natural expanded radius or diameter greater than the radius or diameter of a gun barrel or chamber. This embodiment will then have a normal tendency to expand within a bore or chamber to effect a gripping action. On the other hand, the expansible members may be shaped to have a natural contracted position. In this embodiment, a wedge acts to drive the expansible members into a locking position. When unlocked, however, the members then strive to return to their natural contracted position.

The expansible members may conveniently be fingers or arms that possess small flanges, nubs, protrusions or other types of gripping surfaces or features at the outer ends or tips.

Various mechanisms may be employed to retract a wall anchor from its expanded, anchored position within a gun barrel or chamber. A simple approach lies in forcing a small end of the key member through the outer end of the locking member against the wedge so as to dislodge the wedge from the expansible members. To this end, a spring may be attached to the outer or trailing end of the wedge member and extend toward the trailing end of the locking member. Thus, when the leading end of a key member is inserted into the trailing end of the locking member so as to engage the locking member, the leading end of the key member may also compress the spring and thereby transmit force via the spring against the wedge.

The wedge has flanges that protrude from its sides and rub against the interior the barrel as the locking member travels through the barrel the firearm. The rubbing action provides resistance against the axial extraction force exerted on the locking member by the key rod as the locking member is pulled through the open end of the barrel. This resistance helps disengage the wedge from the locking member.

The flanges on the wedge also act as stops to prevent the wedge from traveling too far into the locking member. The flanges fit between the fingers of the locking member. The axial progression of the wedge into the locking member stops when the flange on the wedge engages the base of the gap formed between adjacent fingers.

Manipulation of the locking members to a locked position or to an unlocked position is preferably performed with a key member such as described above. A preferred key member is one which cooperates with a spring or other elastically resilient member in the body member. Thus, a spring or the like may be positioned within the body between the wedge and the trailing end of the body. Compression of the spring may then be employed to help force the wedge out of engagement with the wall anchor members when in their expanded position. Complete separation of the wedge from the body may be prevented by suitable shoulders or tapered surfaces within the body.

The key member is conveniently employed to disengage the wall anchor assembly from within a firearm, and thereby enable the locking member to be withdrawn from the firearm. Thus, the key member may be configured at its leading end to releasably engage or couple with the trailing end of the locking member. Once engaged with a locking member of the spring type mentioned above, for example, an axial force may be applied by the key member to the spring member; and the spring force may disengage the wedge and cause retraction of the wall anchor mechanism. The key mem-

ber may then be employed to withdraw the locking member from the firearm.

## GENERAL DESCRIPTION OF INVENTION

The present invention comprises an improvement over existing firearm locking methods and apparatus which is less susceptible to failure and external tampering, and also provides quick visual verification that the firearm is locked. The present invention is inserted into the open end of the barrel of a firearm. In a preferred form, a key rod contacts the locking member and urges it into position inside the chamber of a revolver, semi-automatic pistol or the like. The locking member may conveniently be positioned just outside the chamber of a revolver, by engaging the lip formed by the forcing cone adjacent the chamber. Alternatively, the locking member may be positioned adjacent the chamber of a semi-automatic weapon by engaging the lip formed by the junction of the chamber and the bore.

The locking member comprises a wedge member and a set of radially expanding fingers or other anchor members protruding from a cylindrical member. The expanding members are preferably made of an elastic, flexible and tough material such as Nylon-6 so that the protruding anchor members are elastically flexible. The cylindrical body of the expanding member is slightly smaller than the inner diameter of the firearm barrel and the chamber to facilitate entry into the chamber. A shaped flange or lobe preferably extends from the tip end of each finger or anchor member and perpendicularly to the longitudinal axis of the locking member. The diameter of a circle formed by a full angular rotation of a radius measured from the longitudinal axis of the locking member to the outermost surface of the expanded anchor member is greater than the inner diameter of the bore or chamber. As the locking member travels down the bore, the flexible fingers may be constructed to press against the inside of the bore seeking to expand to their natural diameter which is larger than the diameter of the bore. This seeking facilitates a secondary locking mechanism as the anchor members expand to engage the lips formed by the junction of the bore and the chamber or forcing cone which both have a larger diameter than the bore. Flexible tips of the anchor members may be designed to compress so as to facilitate the locking member's entry into the smaller diameter of the gun barrel.

In one application of the key rod, this member is made to travel along the bore of the barrel and to urge the locking member toward the chamber. In an initial or primary locking mode, the wedge at the end of the locking member engages and stops against either the head of a bullet in a revolver or a the back of an empty chamber in a revolver or a semi-automatic weapon. The resulting resistance to the advancing key rod drives the wedge into the locking member, thereby causing the expansible wall anchor members of the locking member to expand and spread radially. The wedge also penetrates the locking member, until the wall anchor members firmly grip the interior surface of the surrounding chamber. At this point the locking member is firmly wedged in place and the key rod may be removed. The firearm is now locked.

The locking member is longer than the chamber of a revolver, so that the locking member protrudes out of the chamber and into the bore of the revolver barrel. The locking member thereby prohibits rotation of the cylinder; and the locked revolver cannot be cocked or



▲ Full Text  
? Help

Go to Page:


Sections:

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 05052142

Section: Front Page 1 of 7 pages

[Help](#)

# United States Patent [19] Mikus

[11] Patent Number: 5,052,142  
[45] Date of Patent: Oct. 1, 1991

## [54] SAFETY LOCK FOR REVOLVERS

[76] Inventor: Edward M. Mikus, 3123 Zariada,  
Metamora, Mich. 48455

[21] Appl. No.: 533,824

[22] Filed: Jul. 16, 1990

[51] Int. Cl.<sup>3</sup> ..... F41A 17/02

[52] U.S. Cl. .... 42/70.11

[58] Field of Search ..... 42/66, 70.11

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3,360,880	1/1968	Finnegan	42/70.11
3,378,943	4/1968	Valburg	42/70.11
4,048,741	9/1977	Chiodo et al.	42/70.11

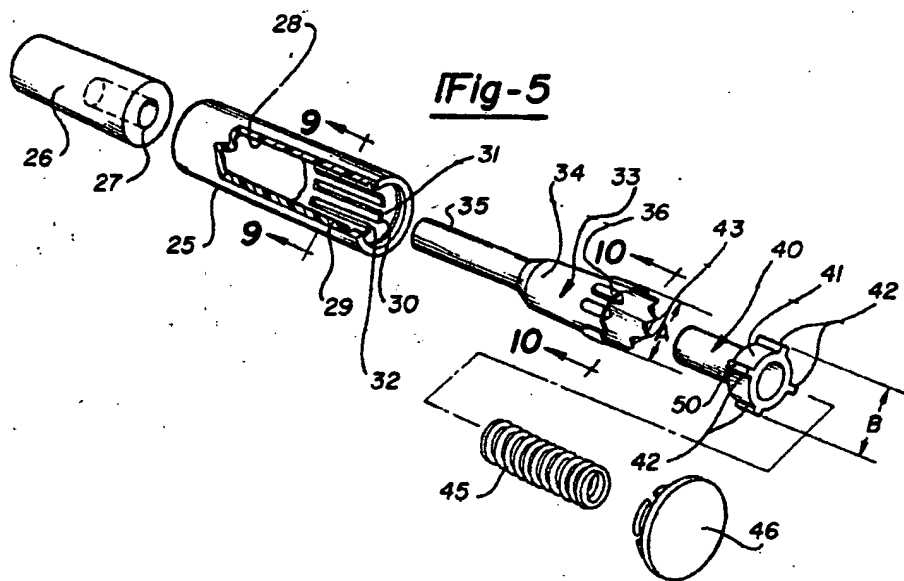
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4,802,298 2/1989 Baugus ..... 42/70.11  
4,827,649 5/1989 Sheehan ..... 42/70.11

Primary Examiner—Charles T. Jordan  
Attorney, Agent, or Firm—Dykema Gossett

## [57] ABSTRACT

There is disclosed a safety device for a firearm in the form of a cartridge insertable within the chamber of a revolver, rifle or the like such that when the particular opening in the firing chamber of the firearm is aligned with the barrel, a plunger will extend from a cartridge-like casing into the barrel and thus block the firing of the firearm. The safety device disclosed to accomplish this purpose is in the nature of a cartridge having a plunger mounted for reciprocal movement therein by a cam and follower-type mechanism such as found in the common ballpoint pen.

8 Claims, 3 Drawing Sheets



Patent Number: 05052142

Section: Drawings 2 of 7 pages

[Help](#)

U.S. Patent

Oct. 1, 1991

Sheet 1 of 3

5,052,142

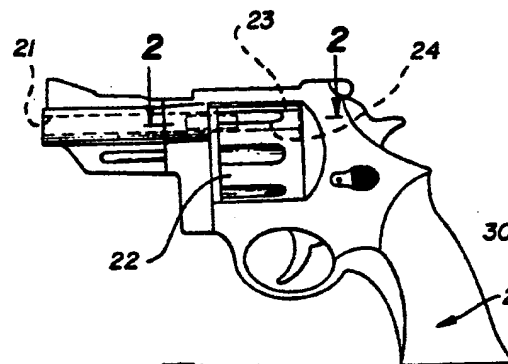
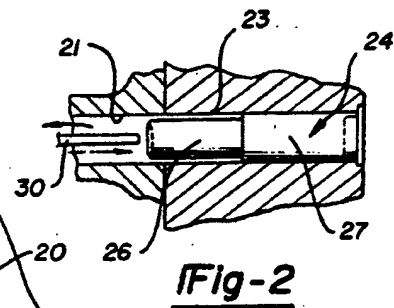
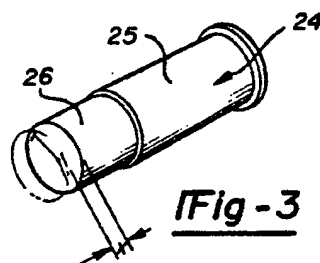
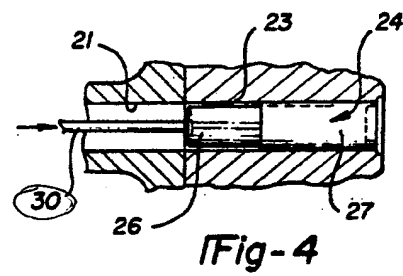
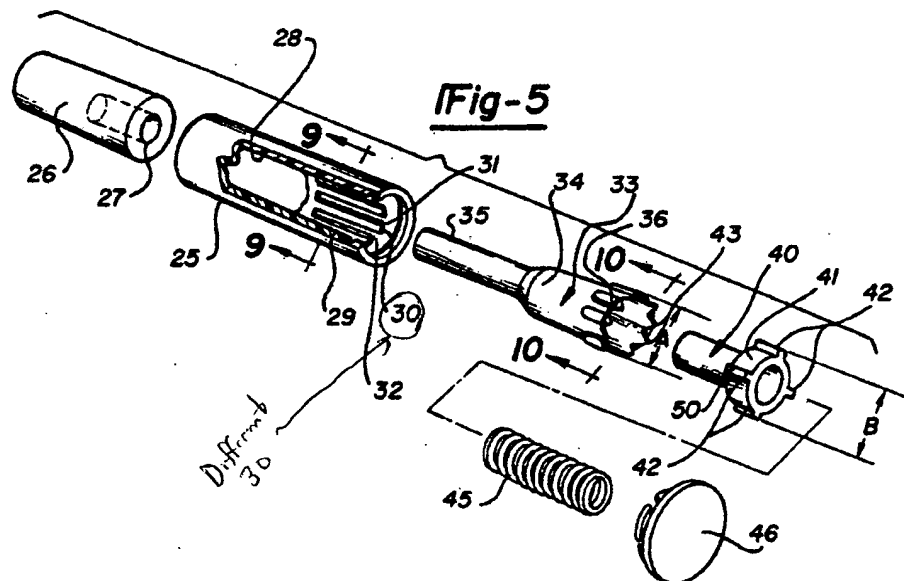
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Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Fig-1Fig-2Fig-3Fig-4Fig-5



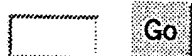
Patent Number: 05052142

Section: Drawings 3 of 7 pages

[Help](#)

▲ Full Text  
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Go to Page:



Sections:

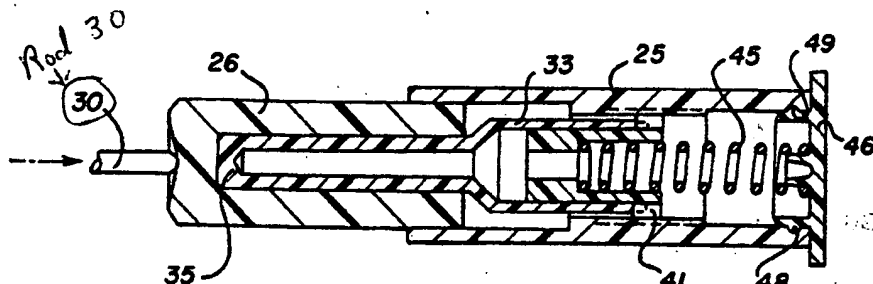
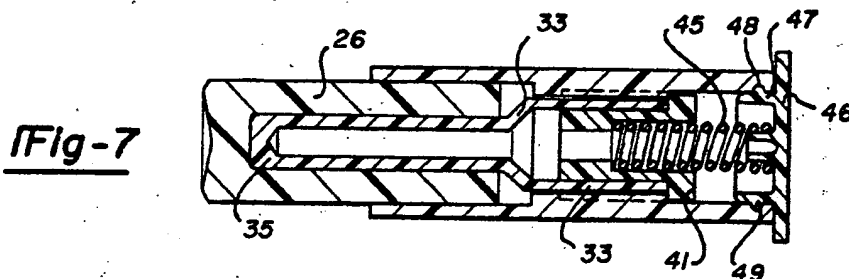
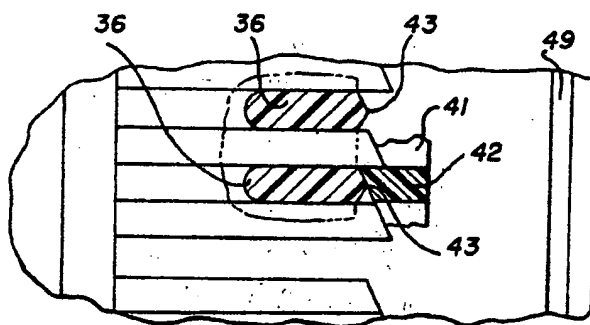
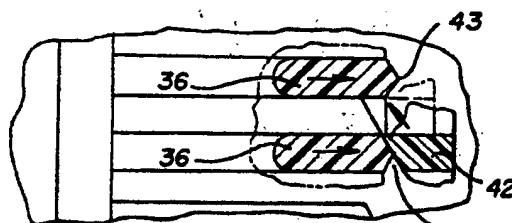
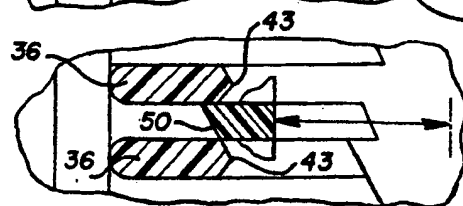
- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

U.S. Patent

Oct. 1, 1991

Sheet 2 of 3

5,052,142

Fig-6Fig-7Fig-8AFig-8BFig-8C

Patent Number: 05052142

Section: Drawings 4 of 7 pages

[Help](#)

U.S. Patent

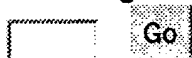
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Sheet 3 of 3

5,052,142

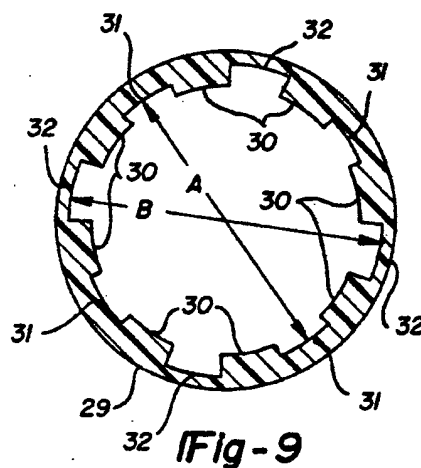
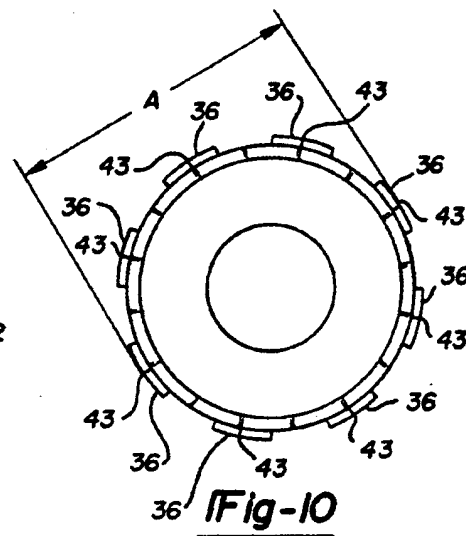
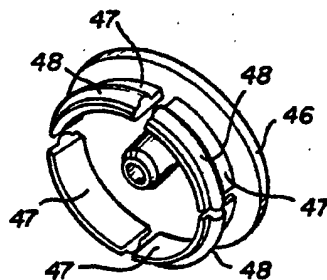
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Go to Page:



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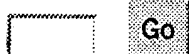
- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Fig-9Fig-10Fig-11



▲ Full Text  
? Help

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

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officer*

## SAFETY LOCK FOR REVOLVERS

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to safety devices for firearms, and more particularly to an improved safety device usable in the firing chamber of rifles, pistols and the like to prevent operation by unauthorized personnel.

#### 2. Description of the Prior Art

During a life-long career in law enforcement, I have had the saddening experience of observing many accidents with firearms due to person's other than the owner handling the gun in the owner's absence. While most firearms are equipped with safety devices, such as safety catches and the like, these are external, and when observed by the unauthorized user of the firearm, can easily be disengaged, allowing the firearm to be fired by the user and in many cases causing injury due to unexpired shells still being present in the firearm.

In order to solve the problem of these injuries occurring, it has occurred to me and to others to have a concealed safety device for use in firearms which would be undetectable by the unauthorized user of the firearm, but easily inserted and activated by the owner thereof to prevent unnecessary injury. In my attempt at arriving at a solution to the problems of injury caused by unauthorized use of firearms, I determined that the easiest way to provide such a safety device was to have a casing of a size insertable into the firing chamber of the firearm and have a plunger which can be extended by the owner into the barrel of the firearm, but still be undetectable by the user. There are many such devices on the market, such as those listed below, which were located during a patentability search made through the records of the Patent and Trademark Office.

DATE OF PATENT	PATENTEE	U.S. PAT. NO.
August 27, 1957	W. H. Soski, et al.	2,803,909
July 5, 1960	J. Salva	2,943,411
February 27, 1962	H. M. Wikstrom	3,022,598
April 3, 1962	J. F. Mahan	3,027,674
April 16, 1963	L. C. Robbins, et al.	3,085,360
September 28, 1965	J. E. Giles	3,208,176
January 2, 1968	T. J. Finnegan	3,360,880
April 23, 1968	R. Valburg	3,378,943
June 6, 1978	Moren	4,092,794
February 7, 1989	D. G. Baugus	4,802,298
May 9, 1989	M. J. Sheehan	4,827,649

A study of these patents shows that other inventors have taken many of the steps I took before I arrived at the present invention, but did not go far enough in making a convenient safety device, so that it is believed that many of these devices, because of their inconvenient nature, go unused by the firearm owner after a short while. I, myself, in arriving at the present invention, went through several stages of development, such as having the twisting mechanism disclosed in U.S. Pat. No. 3,360,880 to T.J. Finnegan, a sliding-type plunger such as disclosed in U.S. Pat. No. 3,378,943 to R. Valburg, and the screwdriver-type device in U.S. Pat. No. 4,092,794 to Moren.

However, as stated above, after a short while, all of these proved to be too difficult to operate because of the need for a special tool, and I next tried a solution to the problem similar to that disclosed in U.S. Pat. No. 3,027,674 to J.F. Mahan of having a casing insertable in

a revolver chamber with a spring-loaded plunger. However, even this proved to be too difficult to operate as one had to keep the spring-loaded plunger depressed while trying to close the revolver cylinder, and in removing the device from the cylinder, one had to keep the plunger depressed with the rod while again opening the cylinder. I was determined to arrive at a better solution to the problem.

### SUMMARY OF THE INVENTION

After much experimentation, I arrived at a method of keeping the plunger retracted into the casing while inserting and removing the cartridge from the firing chamber of the firearm. I did this after much experimentation by taking the common cam and follower type mechanism which operates the common ball point type pen and adapting it for use in my safety lock by providing grooves similar to those found on the inside of a ball point pen on the inside of the casing and providing the necessary mechanism to extend and retract the plunger like the top of a ball point pen extends and retracts.

Therefore, it is an object of the present invention to provide an improved safety device for firearms of all types, such safety device being designed to provide positive locking against accidental or unauthorized use of the firearm.

A further object of the present invention is to provide a cartridge-type safety device easily placed in the firing chamber of a wide variety of firearms to prevent movement of the firing chamber with respect to the barrel when the safety device is in its operative condition.

A further object of the present invention is to provide a cartridge-type safety device for revolvers wherein the cartridge may be inserted in the barrel of the revolver, with the plunger remaining retracted while the revolver cylinder is closed, and then the plunger being extended by external means after it is in line with the barrel of the revolver.

A still further object of the present invention is to provide a cartridge-type safety device for firearms having a plunger movable from a retracted position to an extended position when desired by the operator.

A further object of the present invention is to provide a safety device of the foregoing nature wherein the plunger is operated by a ballpoint pen-type pen mechanism.

Further objects and advantages of the present invention will become apparent with reference to the appended drawings wherein like characters represent like parts in the several views. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description, and not of limitation.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of a typical handgun, having the barrel thereof and one of the firing chambers shown in dotted lines, with my invention installed in said chamber and also shown in dotted lines.

FIG. 2 is a sectional view, taken in the direction of arrows, along the section line 2-2 of FIG. 1.

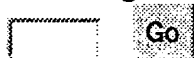
FIG. 3 is a perspective view of the safety device of the present invention showing the plunger in its retracted position in solid lines, and in its extended position in dotted lines, to show the length of travel of the plunger between its extended and retracted positions.

FIG. 4 is a view in large part similar to FIG. 2 showing the operator having inserted a rod and being about



Full Text  
? Help

Go to Page:



#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,052,142

3

4

to operate the plunger to extend it to the position shown in FIG. 2.

FIG. 5 is an exploded assembly view of a construction embodying the present invention.

FIG. 6 is an elevational view of the device shown in FIG. 3 with the plunger in the extended position.

FIG. 7 is an elevational view showing the construction of FIG. 6 with the plunger in the retracted position.

FIGS. 8A-8C are enlarged views showing the operation of the ballpoint pen-type cam and follower mechanism of the present invention which operates to extend the plunger from its extended to retracted positions and back, while keeping said plunger in either the extended or retracted position without further need for assistance by the operator of the firearm.

FIG. 9 is a sectional view, taken in the direction of the arrows along the section line 9-9 of FIG. 5.

FIG. 10 is a sectional view, taken in the direction of the arrows along the section line 10-10 of FIG. 5.

FIG. 11 is a perspective view of the closure member which closes the lower end of the casing in the preferred embodiment of the present invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Although my safety device is usable in a wide range of firearms, such as rifles, revolvers and the like, and in fact can be used in any firearm wherein the extension of the plunger of my safety device will prevent firing of the firearm, for ease of explanation, I am describing the preferred embodiment of my invention with regard to the common ordinary handgun or revolver, generally designated by the numeral 20, as shown in FIG. 1. Such a revolver will have a barrel 21 and a revolving cylinder 22, with a plurality of chambers 23. The safety device, generally designated by the numeral 24, is designed to be inserted in its retracted position into one of the chambers 23 while cylinder 22 is open, and be subsequently placed in its operative position to engage a portion of the barrel 21, thereby preventing the operation of the revolver by preventing the operation of the cylinder which, as is well known in the art, will prevent the handgun from operating.

As shown in FIG. 3, my improved safety device generally consists of a casing 25 and a retractable plunger 26 which moves between a retracted and extended position upon operation by the owner of the firearm. It is important to note that the plunger does not have to travel very far, only a short distance X to engage the barrel 21 of the firearm 20 to prevent its rotation. This can be seen in more detail by referring to FIGS. 2 and 4, which show in an enlarged section the barrel 21 of the revolver 20 with one of the firing chambers 23 having my improved safety device 24 mounted therein and the chamber 23 being in line with the barrel 21.

Referring now to FIG. 4, my safety device 24 is shown having the plunger 26 in its retracted position and being installed in one of the chambers 23 of the revolver 20, which is in alignment with the barrel 21 thereof. The operator is just about to extend the plunger 26 by the use of the rod 30.

As seen in FIG. 2, the operator, by slightly depressing the plunger 26, has caused operation of the plunger extension and retraction means which, in the preferred embodiment of the invention, is a cam and follower-type mechanism which may be of the type found in the common ballpoint pen and which for ease of explanation I will refer to as a "ballpoint pen-type mechanism."

It should be understood that a wide variety of cam and follower mechanisms may be used to cause the operation of the plunger in the present invention and still achieve the purposes of my invention, as long as the plunger remains in its extended or retracted position, as desired by the operator, once it is placed in such position. I have chosen a "ballpoint pen-type" mechanism because it is widely known and accomplishes the intended function in an efficient and low-cost manner.

Referring to FIG. 5, there is an exploded view showing how I have applied the ballpoint pen mechanism to operate the plunger of my device. As can be seen, I have used the ballpoint pen mechanism somewhat in reverse, as I am concerned with the operation of what could be called the plunger, rather the ballpoint pen cartridge, and certain modifications have been needed. The casing 25 has a plunger-receiving portion 28 into which the plunger 26 fits in a slidable relationship, preferably with some friction between the walls of the plunger 26 and the casing 25 for purposes to be explained hereinafter. One end of the plunger 26 has a recess 27 for purposes to be described. At the other end of the casing 25 from the plunger-receiving portion is a slotted portion 29 having a plurality of slots terminating in first cam surface 30. By referring to FIG. 9, it can be seen that the depths of the slots are of two different types. There are a predetermined number of shallow slots 31 and an equal number of deep slots 32. In the common ballpoint pen-type mechanism, there are four shallow slots and four deep slots. The reason for this will become evident from the following brief explanation of the operation of a ballpoint pen-type mechanism as adapted to the present invention.

In order to operate the plunger 26 in a reciprocal manner within the casing 25, there is first provided a plunger extension member 33 having a barrel portion 34 and an extension portion 35. It can be seen that the extension portion fits into the recess 27 in the plunger 26. The barrel portion 34 of the plunger extension member 33 has a plurality of radially extending projections of outside diameter A, as shown in FIG. 10, which will allow the plunger extension member 33 to move up and down in a reciprocal manner in the shallow slots 31 and the deep slots 32, because of the virtue of it being of a minor diameter A, rather than the major diameter B, shown in FIG. 9. Thus, the plunger extension member 33 does not rotate as it reciprocates and will reciprocate regardless of how it is inserted in the slotted portion of the casing 25. This is not true for the plunger control member 40 which has an enlarged portion 41 having a number of ridges 42 thereon, one-half in number of the projections 36. Also, the ridges 42 are of major diameter B, such that they can only travel up and down in the deep slots 32 and will not move downward in the shallow slots 31.

Because of the wedge shape 50 of the forward end of the ridges 42 and because the plunger control member 41 is biased toward the pointed cam surfaces 43 on the projections 36 by the spring 45, which is held in place by the snap closure 46, each time the operator depresses plunger 26, the plunger extension member 33 is forced downwardly in the slots 31, 32, the ridges 42 temporarily leave the deep slots 32 and rotate a portion of a revolution and come to a stop against the cam surface 30 of the casing 25 because they cannot travel downwardly in the slot 31 because of interference between the ridges which are of a diameter B and the shallow

Similar to  
ball point  
pen action

Patent Number: 05052142

Section: Claims 7 of 7 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,052,142

5

slots which are of a diameter A. Thus, the plunger control member stays at the bottom of the casing 25, and because of the friction of the plunger 26 against the plunger-receiving portion 28 and the friction between the recess 27 and the extension portion 36 of the plunger extension member 33, the plunger 26 stays in its retracted position until the operator again slightly depresses the plunger which causes the plunger control member 40 to again make a portion of a revolution, at which time it can travel upwardly in the deep slots 32 propelled by the spring 45 to extend the plunger 26.

For ease of assembly, I choose to use a snap closure 46 to close the end of the casing 25, although any practicable closure means may be used. Referring to FIG. 11, there is shown closure member 46 having a plurality of flexible upstanding projections 47 each of which has a beaded portion 48. When inserted into the bottom portion of the casing 25 the upstanding portions 47 will flex inwardly slightly allowing the beaded portions 48 to engage the slot 49 and thereby close the end of the casing 25.

Thus, by taking the well-known ballpoint pen mechanism and adapting it for use in a safety device for a revolver, by essentially using said ballpoint mechanism in reverse, I have come up with a novel safety device which is convenient for the user, is internal in nature, and has solved many longstanding problems in the art.

I claim:

1. A safety device for a firearm operable from a closed to an open position which, when in its open position, prevents operation of said firearm, said safety device including:

- (a) a hollow casing having a plunger receiving portion and an extension member receiving portion,
- (b) a plunger mounted for reciprocal movement in said plunger-receiving portion,
- (c) a plunger extension member operatively connected to said plunger to move said plunger from a retracted to an extended position,
- (d) a plunger control member,
- (e) a closure member, and
- (f) spring-biasing means interposed between said closure member and said plunger extension control member.

2. The device defined in claim 1, wherein said plunger extension member has an upper extension portion and a barrel portion separated by a bevel portion, said barrel portion having a plurality of radially spaced cam followers cooperating with mating cam surfaces provided in said plunger-receiving portion of said plunger of said hollow casing, the upper surfaces of said cam followers having a second cam surface, said extension portion fitting into a recess of said plunger.

6

3. The device defined in claim 2, wherein said plunger control member fits in a recess in said plunger extension member and has a plurality of second cam followers radially spaced about the lower periphery thereof cooperating with said second cam surfaces to rotate said plunger control member each time said plunger is depressed.

4. The device defined in claim 3, wherein the diameter of said plunger control member across said second cam followers is greater than the diameter of said plunger extension member measured across said first cam followers, the diameter of said second cam followers being equal to the major diameter of the interior of said extension member receiving portion of said casing and the diameter measured across the first cam followers of said plunger extension member being equal to the minor diameter of the interior of said plunger-receiving portion.

5. The device defined in claim 4, wherein said closure member for closing the lower extremity of said casing is a snap-in member.

6. The device defined in claim 5, wherein said plunger is fixedly attached to said extension portion of said plunger extension member.

7. A safety device for a firearm of the revolver type having a barrel and a rotating cylinder, said safety device operable from a closed to an open position, which when in its open position prevents operation of said firearm by having a plunger extending from said safety device into the barrel of said firearm, said safety device including:

- (a) a hollow casing,
- (b) a plunger mounted in said hollow casing for reciprocal movement, and
- (c) a spring loaded cam and follower mechanism which keeps said plunger in a fully extended or a fully retracted position, and is changeable from said fully extended to said fully retracted position, and visa versa, by depressing said plunger.

8. A safety device for a firearm, said safety device operable from a closed position to an open position, said safety device when in its open position preventing operation of said firearm, said safety device including:

- (a) a hollow casing portion,
- (b) a plunger portion mounted in said hollow casing for reciprocal movement therein, and
- (c) a spring loaded cam and follower mechanism which keeps said plunger either in a fully extended or a fully retracted position, said plunger being changeable between said fully extended and said fully retracted position by depressing and releasing said plunger.

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Patent Number: 05010674

Section: Front Page 1 of 5 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

## United States Patent [19]

Horton

[11] Patent Number: 5,010,674

[45] Date of Patent: Apr. 30, 1991

[54] SPRING ACTUATED SAFETY CARTRIDGE

[76] Inventor: Don Horton, 5902 Kirkwood Pl. N.,  
Seattle, Wash. 98103

[21] Appl. No.: 401,098

[22] Filed: Aug. 31, 1989

[51] Int. Cl.<sup>3</sup> ..... F41A 17/00

[52] U.S. Cl. .... 42/70.11

[58] Field of Search ..... 42/70.11

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Primary Examiner—Harold J. Tudor

## [57] ABSTRACT

It is a spring operated device which can be placed in a gun like a cartridge. It does not fire a bullet like a conventional cartridge. When the gun is fired a spring will release and render the gun inoperable. In one embodiment, the device can be reset by pushing a rod down the barrel of the gun and compressing the spring.

3 Claims, 2 Drawing Sheets



Patent Number: 05010674

Section: Drawings 2 of 5 pages

[Help](#)

U.S. Patent

Apr. 30, 1991

Sheet 1 of 2

5,010,674

▲ Full Text  
? Help

Go to Page:

Go



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Fig. 1

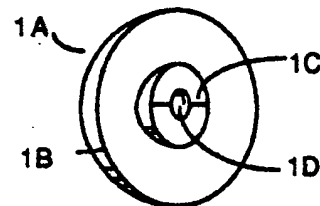


Fig. 2

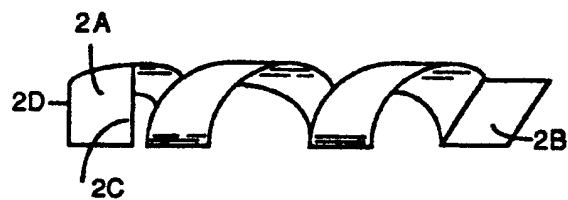


Fig. 3

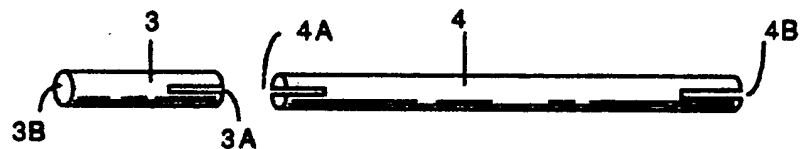


Fig. 4





Patent Number: 05010674

Section: Drawings 3 of 5 pages

[Help](#)

U.S. Patent

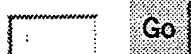
Apr. 30, 1991

Sheet 2 of 2

5,010,674

[Full Text](#)  
[Help](#)

Go to Page:



Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

Fig. 5

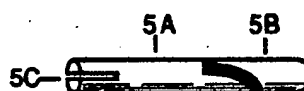


Fig. 6

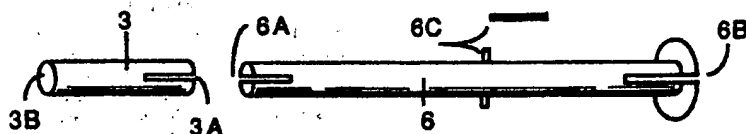
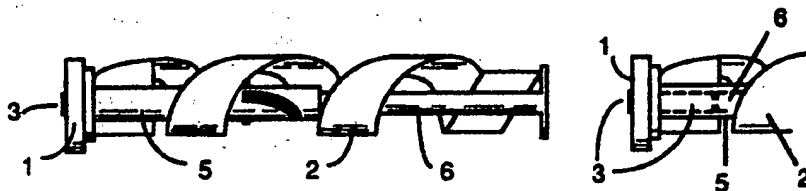


Fig. 7





Full Text  
? Help

Go to Page:

 Go


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,010,674

1

# SPRING ACTUATED SAFETY CARTRIDGE

## BACKGROUND OF THE INVENTION

This invention is related to another invention titled Safety Cartridge, Ser. No. 07/150,240, filed Jan. 29, 1988.

This invention is of a spring device which can be inserted into a gun like a bullet and, when actuated by a firing pin, is released and disables the gun.

It is an object of this invention to provide a device which, when a gun is fired by accident, or by a person not familiar with the gun, disables the gun.

## SUMMARY OF THE INVENTION

The present invention consists of a coiled ribbon of spring steel mounted on a bullet rim. The bullet rim contains a plunger that can be pushed by the firing pin and in turn can push a second pin that releases the spring. When the spring is released, it expands and lengthens as it unwinds.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the rim and base.

FIG. 2 illustrates the spring.

FIG. 3 illustrates the plunger and spring retaining pin.

FIG. 4 illustrates the device assembled.

FIG. 5 illustrates a spring retaining pin reset guide sleeve.

FIG. 6 illustrates a resettable spring retaining pin.

FIG. 7 illustrates the resettable device assembled.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates a single part 1 which has a rim 1A and a pedestal 1B rising up from the rim. The pedestal has a diameter smaller than the rim. A slot 1C is cut through the center of the pedestal and a hole 1D goes through the center of the rim and pedestal.

FIG. 2 illustrates a spring 2 made from a ribbon of coiled flat spring steel. The base of the spring 2A is flat and one edge is set into the bottom of the slot 1C in the pedestal. (The edge of the spring in the bottom of the slot is the trailing edge 2D. The edge opposite from this edge is the leading edge 2C.) The spring is bent around the pedestal, beginning where the spring extends from the slot, into a spiral. In the compressed state, the spiral has a diameter of a cartridge wall. Where the spring is adjacent to the pedestal it fits snugly against the pedestal to help hold the rim-pedestal in place and may have a somewhat smaller diameter than a cartridge wall. At the opposite end of the spiral from the rim-pedestal is the front 2B, where the spring is bent again and goes through a deep slot 4B in the retaining pin 4.

FIG. 3 illustrates a plunger 3 and a retaining pin 4. The plunger is set in the hole 1D (through the center of the rim-pedestal). The plunger has a slot 3A cut in the front end so it can fit astride the spring. The spring, in the slot 1C in the pedestal 1B, crosses the plunger hole. When the plunger is in its normal position it does not quite extend to the leading edge 2C of the spring. When the plunger is hit by the firing pin and pushed forward it goes to, or slightly beyond, the leading edge 2C of the spring.

The retaining pin 4 has a slot at each end. The front end of the spring 2B is firmly mounted into deep slot 4B at the front end of the retaining pin. The retaining pin extends through the center of the coiled spring to the

2

leading spring edge 2C at the base of the spring. When the spring is tightened, by rotating the front of the spring, the shallow slot 4A at the base of the retaining pin is aligned with the leading edge of the spring 2C above the hole in the pedestal. The retaining pin shallow slot 4A goes over the leading edge and the end of the retaining pin 4A is adjacent to the front end of the plunger.

When the plunger base 3B is hit by the firing pin of the gun the plunger pushes the retaining pin off of the spring. The spring can then uncoil.

Before the retaining pin hit, the coiled length of the cartridge is equal to, or only slightly less than, the length of a revolver cylinder. After the retaining pin is hit, releasing the spring, the coil lengthens. When the coil lengthens, it will extend into the barrel and prevent the revolver cylinder from rotating, thus disabling the gun.

A gun that is not a revolver would also be disabled because the spring will be stuck in the chamber.

Any attempt to extract the cartridge by using the extractor or ejector of a gun will result in the removal of the rim-pedestal from the spring. The spring would remain in the gun.

A second embodiment has additional means for resetting the cartridge after it has expanded in the gun, allowing simple extraction.

Referring to FIG. 5, a hollow sleeve 5A is mounted securely on the rim-pedestal. The sleeve has mounting slot 5C that allow it to fit over the spring. The sleeve has guide slot 5B which form a spiral until near the end adjacent to the base, where the slots are straight in order to guide the pin straight onto the spring. The sleeve encloses the plunger and the bottom portion of the retaining pin. The plunger can slide freely within the sleeve. The retaining pin 6 has pin 6C (see FIG. 6, which slides in the guide slots. The retaining pin can move in the sleeve but its rotation is controlled as it moves in the sleeve by pin 6C riding in the slots. The retaining pin also has a head 6B just above the spring.

The device can be reset by pushing downward on the retaining pin head 6B with a dowel or other tool. As the retaining pin is pushed downward pin 6C in the guide slots 5B force the retaining pin to rotate and then guide the shallow slot straight onto the leading edge of the base of the spring. (The spring is forced to coil as the retaining pin rotates because the front of the spring is in the retaining pin deep slot.)

While the above descriptions contain many specifics these should not be construed as limitations on the scope of the invention but rather as exemplifications of the preferred embodiments.

For example, a device with a circular concave disc could be mounted in a flexible casing. The disc would have a rod that extends from the center of the disc out a hole in the back of the casing so that the rod would be hit by the firing pin. A strike from the firing pin would cause the rod to push on the center of the concave disc to "turn the disc inside out." Blocking means could prevent the disc from going too far "inside out", so the outside radius of the disc would be held in an expanded state. Lever arms could, also be used instead of a disc.

Another approach would be to use latching mechanisms to keep the spring compressed. A device struck by the firing pin could release the latches and allow the spring to expand.

What is claimed:

Patent Number: 05010674

Section: Claims 5 of 5 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

5,010,674

3

1. A cartridge, to be inserted into a gun having a chamber and a firing pin, comprising:

- (a) a spring of a diameter that fits into the chamber of the gun when compressed but would expand into tight engagement if unwound;
- (b) means to hold the spring in a compressed state; and
- (c) means for the firing pin to release the means holding the spring in a compressed state.

2. A cartridge, to be inserted into a gun having a chamber and a firing pin, comprising:

- (a) a rim;
- (b) a spring mounted on the rim;
- (c) means to hold the spring in a compressed state;
- (d) means for the firing pin to release the spring from the means holding the spring in a compressed state; said spring having a diameter that fits into the chamber of the gun when compressed but would expand into tight engagement if unwound; and

4

(e) means to release the spring from the rim if the rim is extracted when the spring is in an expanded state.

3. A cartridge having a circular base with a center to be inserted into a gun having a chamber and a firing pin, comprising:

- (a) a rim plate having;
  - (1) a hole in the center;
  - (2) means to mount a spring;
  - (3) means to support a slidable plunger;
- (b) a coil spring having a base mounted to the rim and a front end;
- (c) a pin having;
  - (1) means at the front end to mount to the spring;
  - (2) means at base to slidably mount the spring;
- (d) a plunger mechanism having;
  - (1) means to be moved by the firing pin of a gun;
  - (2) means to slide across the spring and push the pin when hit by the firing pin.

20

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▲ Full Text  
? Help

Go to Page:


Sections:

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 04783924

Section: Front Page 1 of 8 pages

[Help](#)

# United States Patent [19] Thurber

[11] Patent Number: 4,783,924

[45] Date of Patent: Nov. 15, 1988

[54] HANDGUN SAFETY DEVICE

[75] Inventor: Warren R. Thurber, Westlake Village, Calif.

[73] Assignee: Firelock, Inc., Golden, Colo.

[21] Appl. No.: 14,369

[22] Filed: Feb. 13, 1987

[51] Int. Cl.<sup>4</sup> ..... F41C 17/08

[52] U.S. Cl. .... 42/70.11; 42/95

[58] Field of Search ..... 42/70.11, 95, 96

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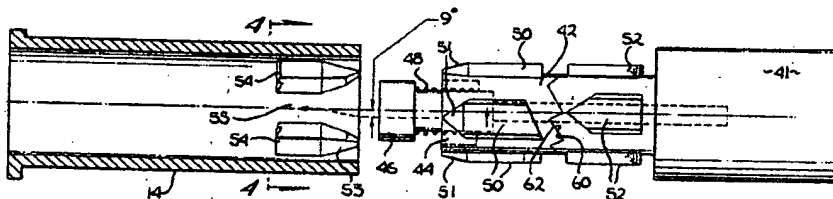
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Primary Examiner—Charles T. Jordan  
Assistant Examiner—Michael J. Carone  
Attorney, Agent, or Firm—Blakely, Sokoloff, Taylor & Zafman

## [57] ABSTRACT

An improved firing safety device for handguns is disclosed. The device prevents the accidental discharge of a gun by children, but is easily removable by an adult thereby allowing the gun to be safely stored in a loaded and fully assembled condition. The gun may thus be readied for use almost immediately. The device includes a cartridge which is inserted into the firing chamber and a rod which is inserted into the gun barrel. The end of the rod is captured by and locked within the cartridge thereby preventing the gun cylinder from revolving. The device is removable by applying manual pressure to a cap at the front of the rod which releases the capture mechanism within the cartridge and allows the rod to be withdrawn from the gun barrel.

13 Claims, 4 Drawing Sheets





▲ [Full Text](#)  
? [Help](#)

Go to Page:



Sections:

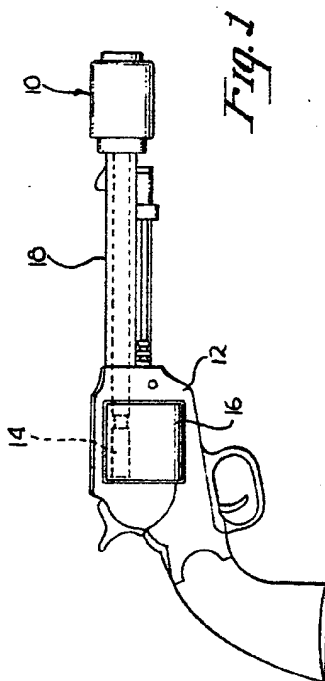
- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

U.S. Patent

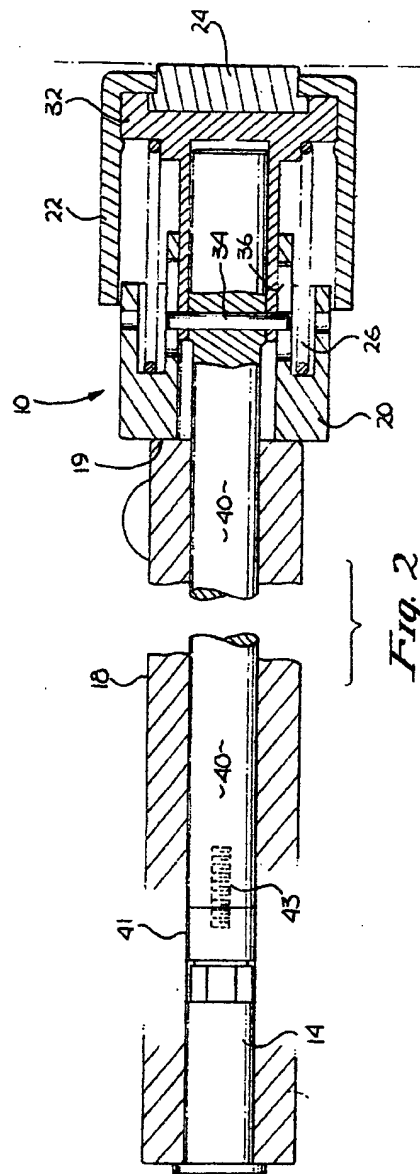
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Sheet 1 of 4

4,783,924



*Fig. 1*



*Fig. 2*

Patent Number: 04783924

Section: Drawings 3 of 8 pages

[Help](#)



U.S. Patent

Nov. 15, 1988

Sheet 2 of 4

4,783,924

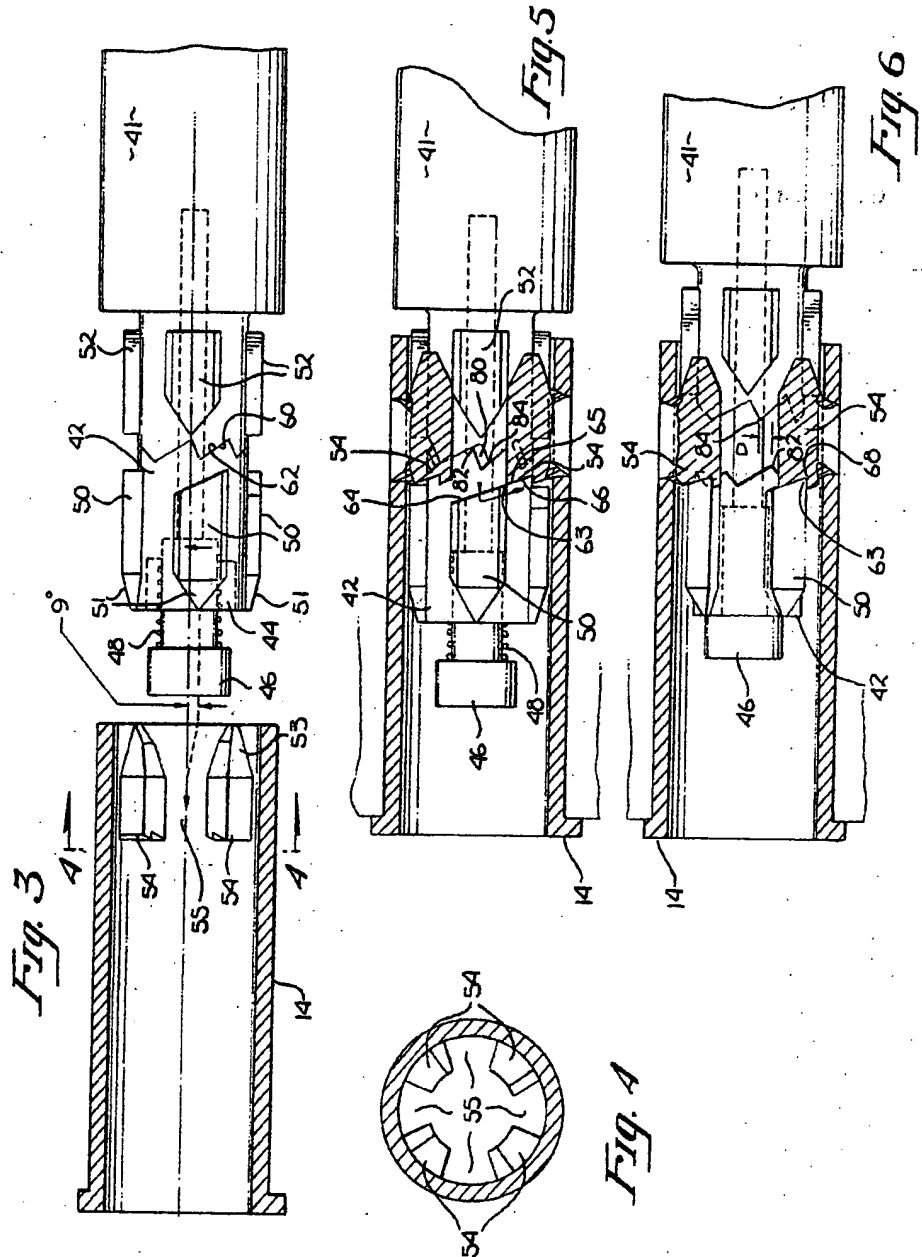
▲ Full Text  
? Help

Go to Page:

 Go


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)



Patent Number: 04783924

Section: Drawings 4 of 8 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

U.S. Patent

Nov. 15, 1988

Sheet 3 of 4

4,783,924

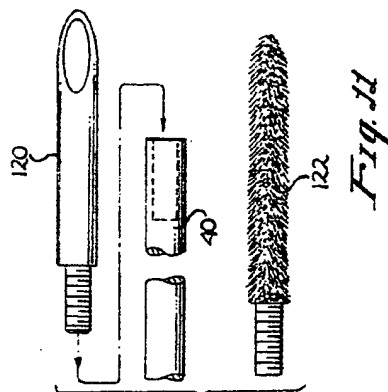


Fig. 11

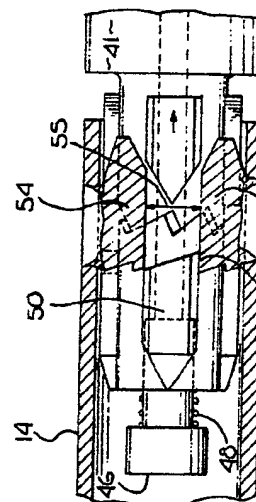


Fig. 9

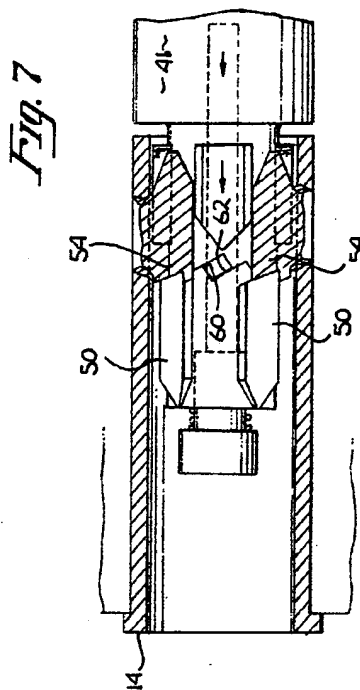


Fig. 7

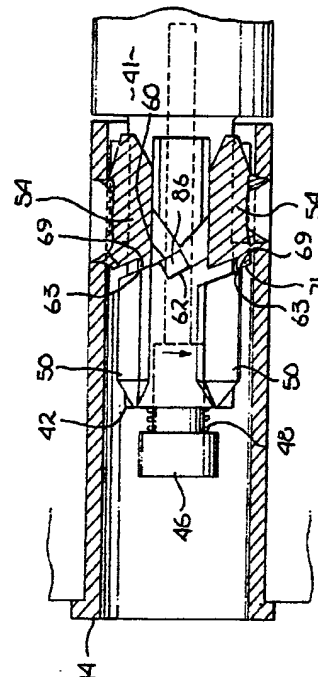


Fig. 8



Patent Number: 04783924

Section: Drawings 5 of 8 pages

[Help](#)

U.S. Patent

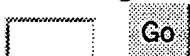
Nov. 15, 1988

Sheet 4 of 4

4,783,924

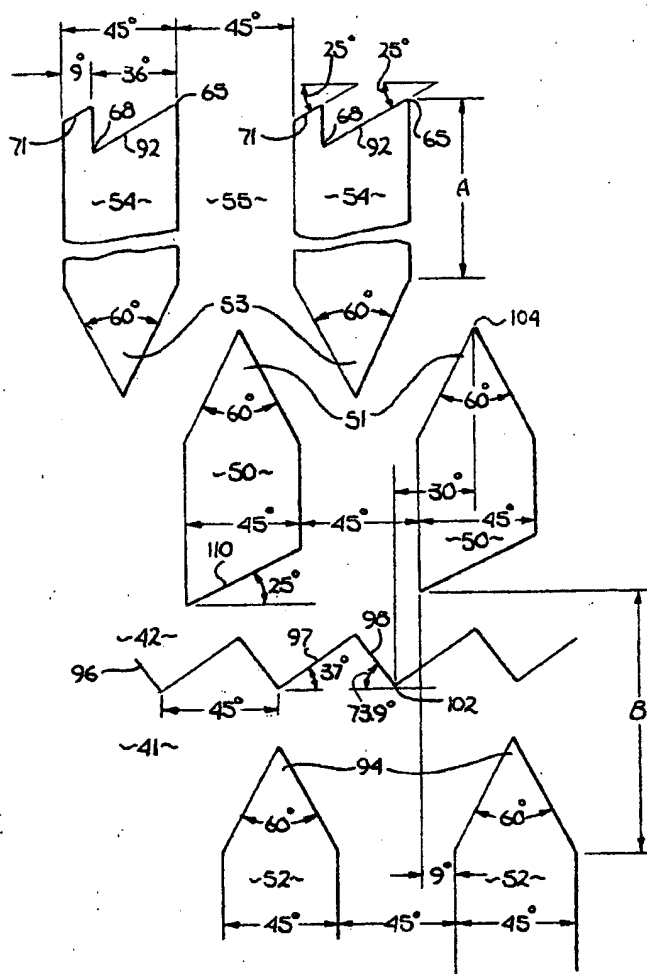
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Go to Page:



Sections:

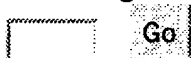
- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

*Fig. 10*



▲ Full Text  
? Help

Go to Page:



#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

1

## HANDGUN SAFETY DEVICE

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to the field of safety device for handguns, and more particularly to devices for the prevention of accidental discharge of handguns.

#### 2. Prior Art

The unintentional discharge of a handgun has been a source of needless injury for many years. Children playing with guns found in the home have been injured or killed at an alarming rate due to accidental firings. Numerous procedures and devices have been suggested to render a firearm "safe" or inoperative in order to prevent accidental firings. In most cases, attempts to prevent accidental discharge require that the firearm be disassembled or maintained in an unloaded condition. Accordingly, the firearm must be reassembled or loaded prior to use. Since most handguns are kept by owners for protection against emergency situations such as the entry of an intruder in the home, it is desirable that the firearm be rendered operable as quickly as possible.

U.S. Pat. No. 4,569,144, entitled "Handgun Safety Device", issued to this inventor discloses a quick release safety device for handguns, which permits a gun to be safely stored in a loaded and fully assembled condition. The device includes a rod which is inserted through the gun barrel and into the empty cartridge chamber. The rod is held in position by a cable which loops around the back of the gun. The device is removable by applying manual pressure to a cap at the front of the rod which depresses a spring and releases the tension on the cable. This device requires a suitable gripping point at the back of the gun and the exposed cable is subject to tampering.

As will be described, the present invention represents an improvement over the above-referenced patent, whereby the locking mechanism of the safety device is entirely within the gun.

### SUMMARY OF THE INVENTION

The present invention is a firing safety device for handguns and is designed to prevent accidental discharge of a gun. The gun cannot be discharged with the safety device in position; however, the device can be removed quickly by application of manual pressure. The amount of pressure required to remove the device is greater than that which a child is physically capable of applying. A rod having a spindle at the end thereof is inserted into the barrel of the gun and a special cartridge is inserted in the firing chamber of the gun. The spindle penetrates the cartridge and is captured by traps molded on the inner surface of the cartridge. A rigid locking member thereby extends from the muzzle to the firing pin of the gun.

The rod is attached to a cap having a rubber bumper. The rod is inserted into the barrel of the gun and pressure is applied to the bumper, such as by pressing against a solid object. The cap encloses a muzzle spring which forces a muzzle stop against the muzzle of the gun. Pressure applied to the bumper compresses the muzzle spring and forces the rod and spindle into the barrel of the gun until the spindle engages the cartridge. The spindle and cartridge are held in an engaged position by the force of the muzzle spring. To remove the device, pressure must again be applied to the bumper to

4,783,924

2

compress the muzzle spring and release the spindle from the cartridge.

The invention thus provides a firing safety device to present the accidental discharge of the gun especially by children. Due to the amount of force required to compress the muzzle spring, the device cannot be removed by children under the age of approximately ten years. However, an adult can quickly remove the device to permit the gun to be fired in an emergency situation.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a handgun showing the locking device and cartridge (in ghost lines) of the present invention in place.

FIG. 2 is a partial enlarged cross-sectional view of FIG. 1.

FIG. 3 illustrates the cartridge and locking device of the present invention as they are brought into engagement.

FIG. 4 is a cross section through line 4-4 of FIG. 3.

FIG. 5 illustrates the cartridge and locking device of FIG. 3 as the spindle penetrates the cartridge.

FIG. 6 illustrates the cartridge and locking device of FIG. 3 in a locked position.

FIG. 7 illustrates the cartridge and locking device of FIG. 3 as they are being disengaged.

FIG. 8 illustrates the cartridge and locking device of FIG. 3 in a further stage of disengagement.

FIG. 9 illustrates the cartridge and locking device of FIG. 3 as the locking device is withdrawn from the gun.

FIG. 10 is a schematic view of the cartridge and locking device of FIG. 3 illustrating certain dimensions thereof.

FIG. 11 illustrates gun cleaning attachments which may be used in conjunction with the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

The present invention is a safety device for handguns designed to prevent accidental discharges, especially by children. In the following description, for purposes of explanation, specific materials and configurations are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one skilled in the art that the present invention may be practiced without these specific details.

Referring to FIG. 1, the present invention includes a locking device 10 which is inserted into the barrel 18 of a handgun 12 and a cartridge 14 which is inserted into cylinder 16. Although a revolver is illustrated in FIG. 1, the present invention may also be used with other types of handguns, such as semi-automatics and automatics.

FIG. 2 illustrates locking device 10 inserted into barrel 18 and capturing cartridge 14. Locking device 10 is gripped by cap 22 to insert rod 40 into barrel 18. Bumper 24, which is preferably made of a resilient rubber-like material, is placed against a solid surface, such as a wall or floor, and pressure is applied to gun 12 forcing muzzle 19 against muzzle stop 20. Muzzle stop 20 telescopes over endpiece 32 and is retained by pin 34 riding in slot 36. Muzzle stop 20 and endpiece 32 are biased apart by muzzle spring 26. Further pressure on bumper 24 causes muzzle spring 26 to compress. Bumper 24 bears against endpiece 32 forcing rod 40 to penetrate further into barrel 18 until rod 41 penetrates cartridge 14 and is captured therewithin. Details of cartridge 14



▲ Full Text  
? Help

Go to Page:


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

4,783,924

3

and rod end 41 which facilitate the capture of locking device 10 within cartridge 14 will be described below. With locking device 10 thus secured, operation of gun 12 is totally disabled. Cap 22 is free to rotate about endpiece 32 thereby rendering secured locking device 10 to tamper resistant.

Locking device 10 is removed from gun 12 by again applying pressure against bumper 24. Further compression of muzzle spring 26 causes rod end 41 to penetrate further into cartridge 14 and be released. Locking device 10 may then be withdrawn from barrel 18. Muzzle spring 26 is sized such that a minimum of 40 pounds of pressure is required to release locking device 10, thereby preventing its removal by children under the age of approximately ten years.

Referring now to FIGS. 3-10, the detailed operation of the locking mechanism will be explained. As best shown in FIGS. 3 and 4, cartridge 14 comprises a flanged hollow cylinder which fits within cylinder 16. Four traps 54 are molded on the interior surface of cartridge 14 near the end opposite the flanged end. Traps 54 are disposed at 90° intervals about the interior circumference of cartridge 14. Cartridge 14 has the approximate dimensions of a shell casing which gun 12 is designed to fire and is preferably made of a high-strength moldable material such as ABS plastic.

The outer dimensions of spindle 42 and rod end 41 are such that they slide within the cylindrical inner surface of cartridge 14. Spindle 42 and rod end 41 are also preferably made of the same material as cartridge 14. Rod end 41 is secured to rod 40 by means of threaded stud 43 as shown in FIG. 2. Rod 40 may be of the same material as cartridge 14, spindle 42 and rod end 41 or may be made of a different material such as aluminum or steel. The length of rod 40 is determined by the barrel length of the gun such that rod end 41 may penetrate cartridge 14, as described below, upon compression of muzzle spring 26. Coarse adjustment of the length of rod 40 may be accomplished by attaching one or more segments joined by threaded studs such as stud 43. Fine adjustment of the length of rod 40 to account for variation in barrel lengths, such as exists between guns of different manufacturers, may be accomplished by partially unscrewing one of the rod segments or by means of a length adjustment (not shown) incorporated within one or more of the rod segments.

Spindle 42 is attached to rod end 41 by means of screw 46. Spindle 42 is urged against rod end 41 by spring 48 which bears against spindle 42 within recess 44. Mating surfaces 60 of rod end 41 and 62 of spindle 42 define a series of alternating ramped annular segments which repeat at 45° intervals about the circumference of rod end 41 and spindle 42. When locking device 10 is not in use, the pressure applied by spring 48 causes surfaces 60, 62 to be everywhere engaged as illustrated in FIG. 3. The travel of spindle 42 on screw 46 is sufficient to allow spindle 42 to be disengaged from rod end 41 so as to rotate freely thereabout but is limited to approximately one-half of the allowable travel of muzzle spring 26, thereby assuring that muzzle spring 26 is partially compressed when locking device 10 is secured within gun 12.

Dogs 50 are molded onto the external surface of spindle 42 and dogs 52 are molded onto the external surface of rod end 41. Dogs 50 and 52 are disposed at 90° intervals about the circumference of spindle 42 and rod end 41 respectively. With surfaces 60, 62 fully engaged, dogs 50 are radially offset from dogs 52 by ap-

4

proximately 9°. Although the invention is described in terms of four each of traps 54, dogs 50 and dogs 52, it is to be understood that other number of these elements may be employed within the teaching of this disclosure subject to corresponding adjustments of the related angular dimensions.

Particular dimensions of the described embodiment are schematically illustrated in FIG. 10. Traps 54 are each 45° in extent as are spaces 55 separating adjacent traps. Notches 68 are 36° from corners 65 so that the radial dimension of surface 71 is 9°. Surface 71 and surface 92 of traps 54 are inclined by 25° from a plane perpendicular to the axis of cartridge 14. Surface 110 of spindle dogs 50 is similarly inclined at an angle of 25°. Dogs 50 and 52 are all 45° in extent and separated from adjacent dogs by 45°. As described above, dogs 50 and 52 are radially offset by 9°. Tapered ends 51, 53 and 94 all have included angles of 60°.

Parting line 96, defining mating surface 60, 62 of rod end 41 and spindle 42 respectively, comprises a series of ramps 97 repeating at 45° intervals and inclined at 37° to a plane perpendicular to the axis of rod 40 alternating with ramps 98 inclined at approximately 73.9°. Point 102 of line 96 is radially located 30° from tip 104 of spindle dog 50. In order to assure simultaneous alignment of dogs 50 and 52 in spaces 55 during insertion of locking device 10 into cartridge 14, dimension "A" of FIG. 10 must be greater than dimension "B" by at least an amount corresponding to the axial displacement of spindle 42 resulting from a 9° rotation with respect to rod end 41.

Referring now to FIG. 3, as rod 40 is inserted in barrel 18, tapered ends 51 of spindle dogs 50 contact tapered ends 53 of cartridge traps 54. As further pressure is applied, spindle 42 rotates such that dogs 50 are aligned with spaces 55 between cartridge traps 54. The path of dog 50 designated "A" in FIG. 3 as it penetrates cartridge 14 is shown generally by the dashed arrow. As spindle 42 rotates, ramped surface 62 of spindle 42 slides along ramped surface 60 of rod end 41, thereby creating gap 80 and partially compressing spring 48. With spindle dogs 50 aligned with spaces 55, rod 40 may be further inserted so that dogs 52 are received within spaces 55 as shown in FIG. 5. At this point, corner 63 of spindle dog 50 just clears corner 65 of cartridge trap 54. Pressure applied by compressed spring 48 causes surface 62 to slide with respect to surface 60, thereby closing gap 80 and causing spindle 42 to rotate in the direction shown by the arrow in FIG. 5. As spindle 42 thus rotates, ramped surface 64 of spindle dog 50 engages ramped surface 66 of cartridge trap 54.

The engagement of surfaces 64, 66 prevent spindle 42 from being withdrawn from cartridge 14. As pressure against bumper 24 is released, muzzle spring 26 forces rod 40 to withdraw. Spindle 42 continues to rotate until corner 63 of spindle dog 50 engages notch 68 of cartridge trap 54 as shown in FIG. 6. At this point, the engagement of spindle dog 50 and notch 68 prevent further rotation of spindle 42. The angles of ramped surfaces 60, 62 and the location of notch 68 on trap 50 as illustrated in FIG. 10 are so related that when spindle dog 50 rests within notch 68, spindle 42 has rotated through an angle sufficient to cause point 82 of surface 62 to rotate beyond point 84 of surface 60 as indicated by "D" in FIG. 6. Rod 40 is withdrawn by the relaxation of muzzle spring 26 until screw 46 seats against spindle 42. Locking device 10 is then firmly secured

Patent Number: 04783924

Section: Claims 8 of 8 pages

Help



▲ Full Text  
? Help

Go to Page:


Sections:

- Front Page
- Drawings
- Specifications
- Claims

4,783,924

5

within gun 12 by the remaining compression of muzzle spring 26.

Locking device 10 is removed by again applying pressure against bumper 24 to compress muzzle spring 26 and force rod 40 further into barrel 18. Referring to FIG. 7, as rod 40 is forced in the direction shown by the arrows, ramped surface 60 of rod end 41 contacts ramped surface 62 of spindle 42. Spindle 42 is thereby forced further into cartridge 14 such that corner 63 of spindle dog 50 clears corner 69 of cartridge trap 54 as shown in FIG. 8. Pressure applied by spring 48 again causes surface 62 to slide with respect to surface 60, thereby closing gap 86 and causing spindle 42 to further rotate in the direction shown by the arrow in FIG. 8. Spindle 42 continues to rotate and move axially against rod end 41 until gap 86 is fully closed. At this point, surface 64 of spindle dog 50 will be in contact with surface 71 of trap 54. Continued withdrawal of rod 40 from the gun barrel due to the force of the muzzle spring will cause surface 60 of rod end 41 to separate from surface 62 of spindle 42 in an axial direction and will cause spring 48 to compress. Surface 64 of spindle dog 50 will slide with respect to surface 71 of trap 54, causing spindle 42 to further rotate in the direction of the arrow shown in FIG. 8.

Spindle 42 continues to rotate until spindle dog 50 strikes surface 72 of trap 54 as shown in FIG. 9. At this point, spindle dogs 50 are again aligned with spaces 55 in cartridge 14 such that locking device 10 may be withdrawn from gun barrel 18. It should be noted that spindle 42 as portrayed in FIG. 9 has rotated a full 90° from its position shown in FIG. 5.

When locking device 10 is withdrawn from barrel 18 of gun 12, gun 12 is in condition to be fired. In the case of a revolver, cylinder 16 may be rotated by the firing mechanism to a chamber containing a live round. In the case of an automatic, movement of the slide will eject cartridge 14 and permit a live round to enter the firing chamber.

Locking device 10 may be adapted for use as a gun cleaning tool by use of attachments as shown in FIG. 11. Cloth holder 120 and bore brush 122 may be threaded onto rod 40 in place of rod end 41 when it is desired to periodically clean the gun.

While the present invention has been particularly described with reference to FIGS. 1-11, and with primary emphasis on handguns, it should be understood that the figures are for illustration only and not as a limitation upon the invention. It is contemplated that many changes and modifications may be made by one of ordinary skill in the art to the materials and arrangements of elements of the invention, without departing from the spirit and scope of the invention.

I claim:

1. A device for preventing the discharge of a firearm, said firearm having a barrel, a muzzle and a cartridge chamber, said device comprising:

a rod including an inner and an outer end, said rod insertable in the barrel through the muzzle with the outer end extending from the muzzle;

spring means coupled to the rod and disposed against the muzzle when the rod is inserted into the barrel for urging the rod to withdraw from the barrel;

a cartridge disposed in said cartridge chamber;

locking means coupled to the inner end of the rod for engaging the cartridge and locking thereto as said

6

rod is inserted into the barrel such that said spring means is partially compressed;

a spindle disposed at said inner end of said rod said spindle coupled to said rod by retaining means such that the spindle may rotate with respect to the rod about a common longitudinal axis;

said spring means comprising:

a cap coupled to said outer end of said rod and freely rotatable thereabout, said cap including a bumper;

a muzzle stop disposed against said muzzle of said barrel when said rod is inserted into said barrel; and

a muzzle spring disposed between and biasing apart said cap and said muzzle stop.

2. The device of claim 1 wherein said spindle includes a first dog having an anterior surface and disposed on the circumference of said spindle and said rod includes a second dog disposed on the circumference of said rod.

3. The device of claim 2 wherein said spindle and said rod each include a mating surface comprising a plurality of inclined annular segments, whereby rotation of the spindle with respect to the rod imparts a reciprocating motion to the spindle along the longitudinal axis thereof.

4. The device of claim 3 wherein said retaining means includes a spindle spring to urge said spindle against said rod at said mating surfaces.

5. The device of claim 4 wherein said first and second dogs are disposed such that said first and second dogs are not radially aligned when said mating surfaces are fully engaged.

6. The device of claim 5 wherein said cartridge includes an inner cylindrical surface having a plurality of traps disposed thereon and spaced apart such that said first and second dogs may pass therebetween.

7. The device of claim 6 wherein said traps include a notched posterior surface such that, when said spindle and said rod are inserted in said cartridge such that said second dog is inserted between said traps, said anterior surface of said first dog engages said notched posterior surface of one of said traps, whereby said spindle is prevented from being withdrawn from said cartridge.

8. The device of claim 7, wherein said inclined annular segments of said mating surfaces are disposed such that, when said anterior surface of said first dog is engaged with said notched posterior surface of one of said traps and said rod is inserted within said cartridge, said spindle is rotated such that said first dog may pass between said traps, thereby permitting the spindle to be withdrawn from said cartridge.

9. The device of claim 1 further comprising engagement means coupled to said locking means for causing said locking means to engage said cartridge as a first axial force is applied against said outer end of said rod.

10. The device of claim 9, further comprising disengagement means coupled to said locking means for causing said locking means to disengage said cartridge as a second axial force is applied against said outer end of said rod.

11. The device of claim 10 wherein said second axial force is greater than approximately forty pounds.

12. The device of claim 7, further comprising cleaning means threadably attached to said inner end of said rod for cleaning said barrel of said firearm.

13. The device of claim 1 wherein said rod comprises a plurality of longitudinal segments threadably attached one to another.

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## ● Claims

**3,208,176**

Filed June 10, 1964

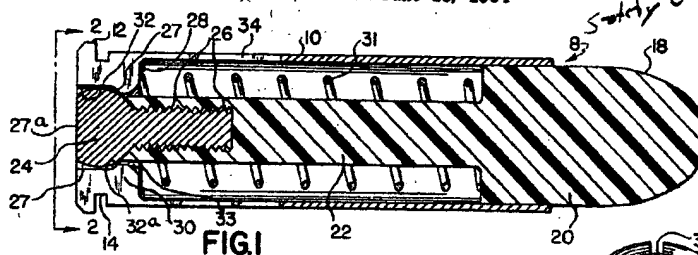
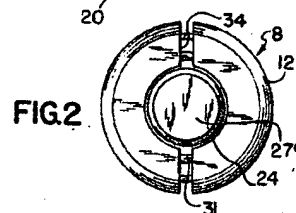
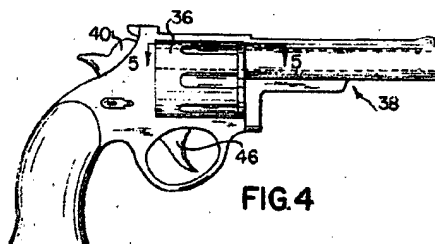
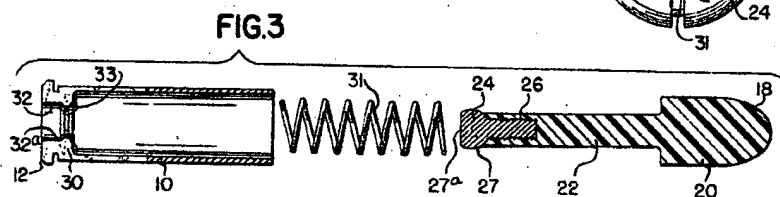


FIG. 1



**FIG.2**



**FIG. 4**

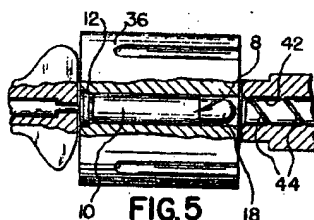


FIG. 5

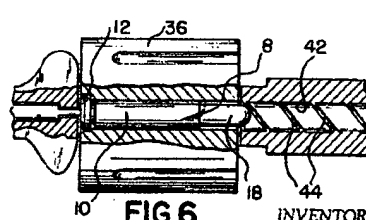


FIG 6

INVENTOR

*Teare, Fether & Teare*  
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Full Text  
? Help

Go to Page:

 Go


#### Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

# United States Patent Office

3,208,176

Patented Sept. 28, 1965

1

3,208,176

## SAFETY DEVICE FOR GUNS

John E. Giles, Rte. 1, Box 41A, Odessa, Fla.

Filed June 18, 1964, Ser. No. 374,051

18 Claims. (Cl. 42--66)

This invention relates to a safety device for weapons, such as a revolver or an automatic type hand gun, and more particularly to a cartridge-like safety device for loading into the gun.

Many people presently own firearms for the protection of their person and property, and the hand gun is generally the most popular since it is effective at close range and is of a more convenient size. However, to be effective in emergencies, the weapon must be close at hand and loaded. Such a situation provides hazards in that a child or unthinking individual may handle the loaded weapon and fire it accidentally to cause unintentional injury or death.

Moreover, police officers, which carry loaded weapons in the performance of their duties, are sometimes wounded or killed by criminals who unexpectedly seize the officer's weapon and shoot such officer with his own gun.

The present invention provides a novel safety device comprising a dummy cartridge which may be inserted in a loaded weapon, and which when disposed in the firing chamber of the gun and actuated by the firing pin thereof, will lock or jam the gun against further use, but which may be readily and quickly moved or by-passed from the firing chamber of the gun to obviate jamming or locking of the latter, by one who is familiar with the operation of the device.

Accordingly, it is an object of the invention to provide a novel safety device for a gun.

Another object of the invention is to provide a novel and simplified safety locking device for causing inoperability of a loaded gun by one who is unfamiliar with the locking device, but wherein the gun can be readily operated by one who is familiar with the operation of the safety locking device.

Another object of the invention is to provide a novel safety device for use in a loaded weapon comprising, a dummy cartridge having a cartridge case and a dummy projectile disposed in the case and projecting forwardly therefrom, and with the dummy projectile being adapted to move forwardly into jamming or locking relation with the gun when the cartridge is actuated by the firing pin of the weapon, thus locking the weapon and preventing use thereof by unauthorized or criminal persons.

Another object of the invention is to provide a safety device in the form of a dummy cartridge for a loaded weapon, which includes a cartridge case and a spring loaded projectile disposed in the case together with means for holding the projectile in predetermined position in the cartridge case, but which is adapted for actuation by the firing pin of the weapon to cause movement of the projectile forwardly with respect to the case, and wherein such dummy cartridge is adapted to be installed in the weapon in such manner that it would be the next round to be fired when the trigger is pulled.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a lengthwise sectioned, elevational view illustrating the dummy cartridge mechanism of the invention;

FIG. 2 is an end elevational view taken generally along the plane of line 2--2 of FIG. 1, looking in the direction of the arrows;

FIG. 3 is a reduced size, exploded sectional view of the cartridge assembly of FIG. 1;

FIG. 4 is a side elevational view of a revolver in which

2

the safety cartridge of the invention may be utilized;

FIG. 5 is an enlarged partially sectioned view, taken generally along the plane of line 5--5 of FIG. 4 and showing the safety cartridge of the invention in position in the firing chamber in the revolver, and prior to actuation of the safety cartridge by the firing pin of the gun;

FIG. 6 is a view generally similar to FIG. 5, but showing the position of the parts of the safety cartridge after it has been actuated by the firing pin; in such position the projectile of the safety cartridge has moved forwardly relative to the case of the cartridge, and into locking condition in the gun barrel to prevent rotation of the gun cylinder and thus prevent further firing of the gun.

Referring now again to the drawings, there is illustrated a safety cartridge 8 comprising a cartridge case 10 of cylindrical configuration, having a lip 12 at one end thereof, defined in part by annular recess 14 in the cartridge case. Disposed in the cartridge case 10 is a projectile member 18, which is preferably formed of plastic material, such as nylon, or some other suitable material.

Projectile 18 comprises a head or nose portion 20 which may be of the general configuration of a bullet of conventional type, and an integral rearwardly extending shank portion 22 of reduced diameter or thickness, compared to the thickness of the nose portion 20. Secured to the end of the shank portion 22 may be a ball-like member 24. Ball-like member 24 is preferably made of metal and may be threaded as at 26 to the shank 22 of projectile 18. Member 24 may comprise generally arcuate or spherical side surfaces 27, and generally flat end surface 27a, for a purpose to be hereinafter described.

Disposed between the nose portion 20 of projectile 18, and an abutment surface 28 of end portion 30 of the cartridge case 10 is a light spring member 31 which is preferably under relatively light compression in the position of the parts illustrated in FIG. 1.

End portion 30 also includes an axial opening 32 there-through defining a generally circumferential shoulder 32a which coacts in engaged relation with the aforementioned ball-like member 24, to normally hold the projectile 18 in the position illustrated in FIG. 1 and against the force of the spring member 31. Shoulder 32a is also sloped as at 33 on the interior end thereof for a purpose to be hereinafter described. The cartridge case 10 is slit as at 34 lengthwise thereof and well beyond the shoulder 32a in the end portion 30, to provide for substantial resiliency of the cartridge 10 in the vicinity of portion 30.

Operation of the device is preferably as follows:

The safety cartridge 8 is loaded along with live ammunition, in, for instance, the conventional cylinder 36 of a revolver 38, and the cylinder is closed in such a manner that the safety cartridge will be the next one to move into the firing position in alignment with the bore of the barrel when the trigger of the weapon is pulled. Thus if a criminal or one unschooled in the method of operation of the device seizes the weapon and pulls the trigger, the cylinder 36 will revolve in the conventional manner moving the safety cartridge to "firing position" and in alignment with the firing pin of hammer 40 and the bore 42 of the barrel in the conventional manner. The firing pin strikes the surface 27a of ball detent 24, and drives the detent out past the relatively shallow shoulder 32a in the opening 32. Since the cartridge case is split as at 34 to provide resiliency to the case, and since the nose portion 20 of projectile 18 may slide relatively easily with respect to the case 10, such projectile moves readily beyond the shoulder 32a upon being hit by the firing pin, and as urged by the spring 31. However, the projectile 18 upon movement into the bore 42 of the barrel, engages the conventional rifling 44 in the barrel and is stopped therein, part of the projectile be-

Patent Number: 03208176

Section: Claims 3 of 4 pages

Help



▲ Full Text  
? Help

Go to Page:


Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

3  
ing in the barrel and part being in the firing chamber of the cylinder. In other words, the diameter of nose portion 20 of projectile 18 is slightly greater than the minimum diameter of the rifling. Thus the cylinder is prevented from rotation, and since the gun cannot be placed in firing condition unless the trigger 46 can be depressed, and since the trigger can be depressed only if the cylinder 36 is rotated, the gun is rendered inoperative. This is accomplished without damage to the gun, since the projectile is preferably, as aforementioned, of relatively soft material.

To render the gun operative, or in other words to unlock the gun by removal of the safety cartridge, a rod or other suitable device, such as a pencil, may be inserted into the barrel from the muzzle, to force the projectile 18 rearwardly against the resistance to compression of spring 31 and out of interlocking coaction with the barrel, back to the position illustrated in FIG. 5.

In this connection, the aforementioned cam-like surfaces 33 on shoulder 32a engaging arcuate surface 27 on detent 24, spring or force the end portions 30 apart to permit passage of member 24 past the shoulder 32a and once again place the cartridge in the condition shown in FIG. 1. Case 10 is preferably of sufficient length so that even when the projectile 18 is in the extended locking condition of FIG. 6, the inner end of nose portion 20 still is disposed in the case, so that the projectile is positively maintained in alignment with the case.

While the safety cartridge has been shown and described in connection with a revolver, it will be understood that it also may be used in automatic weapons or in any other breech loading gun. With such a safety cartridge, and for instance if it were used in a semi-automatic weapon such as the government model 45, the gun would be jammed or locked upon forward movement of the projectile 18 past the shoulder portion 32a on the end section 30 even if an unauthorized person tried to work the slide manually so as to feed a live round into the firing chamber. The projectile portion 18 once it is past the shoulder 32a on the end portion 30 is free of the case for all practical purposes, and upon the ejection of the case in an automatic weapon, the projectile will remain in the gun, probably together with the spring.

Now when the weapon is to be used by someone who is familiar with the operation of the safety cartridge, such individual can quickly index the cylinder past the safety cartridge round or rounds by either pulling back on the hammer 40 slightly and turning the cylinder to a position so as to feed a live round into alignment with the firing pin and the bore of the barrel of the revolver, or the user could ride the hammer with his thumb as he pulls the trigger the first time so that the hammer is let down easily enough that it does not activate the safety cartridge. In other words, the firing pin does not hit detent member 24 sufficiently hard so as to move the latter past the shoulder 32a. In an automatic, the authorized user would manually work the slide so as to eject the dummy cartridge including the projectile so as to feed a live round into the chamber prior to firing. Thus, the gun can be quickly placed in condition for use or for firing, by one who is familiar with the operation of the safety cartridge.

From the foregoing description and accompanying drawings it will be seen that the invention provides a novel arrangement of safety cartridge for use with a weapon, so that the weapon may be kept loaded with live ammunition and convenient to the user, without the danger of injury to some innocent person by the use of the weapon by an unauthorized individual, and wherein the safety cartridge can be readily indexed past its safety position by one familiar with its operation and use, but which safety cartridge will lock or jam the weapon when the trigger is pulled by an unauthorized individual.

The terms and expressions which have been used are used as terms of description and not of limitation, and

3,208,176

4  
there is no intention in the use of such terms and expressions of excluding any equivalents of any of features shown or described, or portions thereof, as is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. A safety device for a gun having a firing pin, a t and a firing chamber for receiving ammunition into alignment with the bore of the barrel, said safety device comprising a dummy cartridge, said dummy cartridge comprising a case and a projectile portion mounted for generally axial movement relative to the case, means coacting between said projectile portion and said case to releasably hold the projectile portion in the case, and means operative to render the first-mentioned means inoperative predetermined impact of the first mentioned means near the firing pin.

2. A safety device for a gun having a barrel, a pin and a firing chamber for receiving ammunition alignment with the bore of the barrel, said safety device comprising a dummy cartridge, said dummy cartridge comprising a case, a projectile portion mounted for movement within said case, means disposed between projectile portion and said case for urging said projectile portion outwardly of said case, means coacting between said projectile portion and said case to releasably hold projectile portion in said case, and means operative to render the second mentioned means inoperative predetermined impact of said second mentioned means near the firing pin.

3. A safety device for a gun having a firing pin, a t and means for carrying a plurality of rounds of ammunition sequentially into alignment with the bore of the barrel, said safety device including a dummy cartridge, said dummy cartridge comprising a case, a forwardly oriented projectile portion mounted for axial movement in said case, resilient means for resisting movement of said projectile in a direction inwardly of the case, means releasably holding said projectile from movement in a direction outwardly of the case, the last mentioned means being adapted for engagement by the firing pin, and means operative to render said last mentioned means inoperative upon said engagement to cause outward movement of the projectile with respect to the case.

4. A safety device in accordance with claim 3, wherein said case comprises a rear end portion having an opening extending therethrough, said projectile having a portion extending into said opening, and said last mentioned means including a shoulder on said end portion of said opening coacting with a detent on said projectile portion.

5. A safety device in accordance with claim 3, wherein said projectile is formed of a plastic material.

6. A safety device in accordance with claim 3, wherein said projectile comprises a nose portion projecting forwardly of the forward end of the case and a reduced shank portion projecting toward the other end of the case, said last mentioned means including a detent member on the rearward end of said shank portion.

7. A safety device in accordance with claim 3, wherein said case comprises a rear section having an axially disposed opening extending therethrough, said projectile including a portion extending through said opening, said last mentioned means including a shoulder on rear section in said opening engageable with a shank on said projectile portion for releasably holding the projectile in place in the case, said means to render said mentioned means inoperative including a slit in said projectile extending in a generally axial direction commencing at the rearward end of said case to increase the resiliency of the case and permit release of said shoulder on the projectile portion from interlocking coaction with the shank on the case upon impacting engagement of the projectile portion by the firing pin.

Patent Number: 03208176

Section: Claims 4 of 4 pages

[Help](#)

▲ **Full Text**  
 ? **Help**

Go to Page:

 
**Sections:**

- **Front Page**
- **Drawings**
- **Specifications**
- **Claims**

3,208,176

5

8. A safety device in accordance with claim 3, wherein said last mentioned means includes a detent on the rearward end of said projectile adapted for engagement with the firing pin, and said detent having a generally planar rear surface extending substantially flush with the rear end surface of the case, said detent being detachably connected to the projectile and being formed of a harder material than said projectile.

9. In combination, a gun having a firing pin, a barrel and movable means including a firing chamber for carrying a plurality of rounds of ammunition sequentially into alignment with the bore of the barrel, and a safety locking device including a dummy cartridge disposed in said moveable means for use in preventing movement of said moveable means upon actuation of said cartridge, said safety locking device comprising a casing, a projectile mounted for axial movement in said casing, means for resisting movement of said projectile in direction inwardly of the casing, means for releasably holding said projectile from movement in a direction outwardly of the casing, the last mentioned means normally preventing the projectile from extending beyond the firing chamber, and means operative to render said last mentioned means inoperative upon predetermined impact of said last mentioned means by the firing pin, said projectile being adapted upon impact of said last mentioned means by said firing pin to extend inwardly into the bore of the barrel of the gun and prevent further movement of the first mentioned means.

10. In combination, a gun having a barrel with rifling,

6

a firing pin, a trigger, and a rotatable cylinder provided with chambers to carry rounds of ammunition into alignment with the bore of said barrel, and a safety device including a dummy cartridge disposed in one of the chambers of said cylinder, said dummy cartridge comprising a casing, a forwardly disposed projectile disposed for axial movement in said casing and having a portion extending through the rearward end thereof, means for resisting movement of the projectile inwardly of the casing, means on said projectile portion coacting with means on said casing to releasably hold the projectile in said casing, and a slit in said casing extending generally lengthwise thereof and being operative to render the holding means coacting between said projectile portion and said casing inoperative upon impacting of said projectile portion by the firing pin of the gun whereby said projectile will move outwardly with respect to the casing and into engagement with the rifling of said barrel, said cylinder being oriented so that said cartridge is next to move into alignment with the barrel's bore upon pulling of the gun's trigger.

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BENJAMIN A. BORCHELT, *Primary Examiner.*



Patent Number: 00037946

Section: Drawings 1 of 3 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:

Sections:

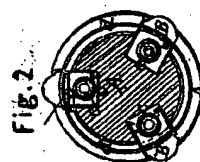
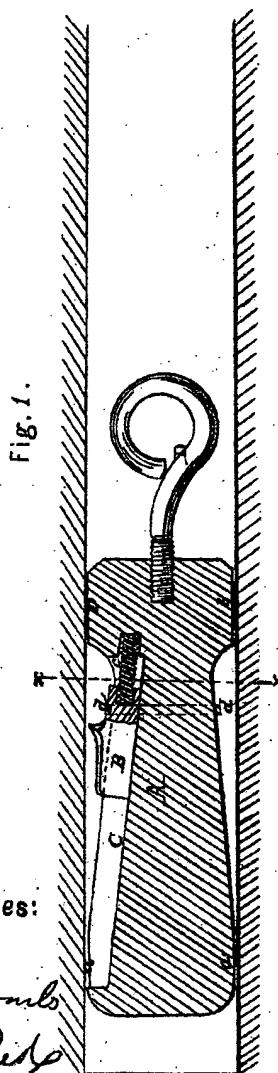
- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

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A. BONANZO.  
Disabling Cannon.

No. 37,946.

Patented March 24, 1883.



Witnesses:

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*G. W. Rude*

Inventor:

*A. Bonanzo*  
Per *Wm. C. Rude*

H. F. JONES, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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Patent Number: 00037946

Section: Front Page 2 of 3 pages

[Help](#)

▲ Full Text  
? Help

Go to Page:


## Sections:

- [Front Page](#)
- [Drawings](#)
- [Specifications](#)
- [Claims](#)

## UNITED STATES PATENT OFFICE.

ADOLPHUS BONZANO, OF DETROIT, MICHIGAN.

## IMPROVEMENT IN IMPLEMENTS FOR DISABLING ORDNANCE.

Specification forming part of Letters Patent No. 37,946, dated March 24, 1863.

*To all whom it may concern:*

Be it known that I, ADOLPHUS BONZANO, of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Apparatus for Disabling Ordnance; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central longitudinal section of the apparatus, showing it applied within the bore of a cannon. Fig. 2 is a transverse section of the same in the plane indicated by the line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists of a block of metal fitted loosely to the bore of a piece of ordnance, and having inclined longitudinal grooves, to which are fitted sliding teeth or cutters, whose operation is so controlled by springs that they offer no obstruction to the passage of the block along the bore; but on any attempt to withdraw the block or drive it out by the explosion of the charge, in case of the gun having been loaded before its insertion, they will cut and indent themselves into the metal of the piece in such manner as to render such attempt unsuccessful.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A is the block of cast or wrought iron or steel, having its ends of cylindrical form, as shown at *a* and *b*, and having the intermediate portion conical.

*c c* are parallel-sided grooves in the conical portion of said block, having their bottoms inclined to the axis of the block, as shown in Fig. 1, such inclined bottoms forming portions of a cone.

B B are the cutters, made of steel, hardened and tempered, and fitted to the grooves *c c* in such manner as to slide freely therein in a longitudinal direction, the points *d d* of the said cutters being directed toward the front end of the block—that is to say, the end next to which the lower parts of the grooves *c c* are situated.

O O are springs so applied to the cutters as to force them along the grooves *c c* toward the higher ends thereof.

*d* is a light band of steel, copper, or other

metal encircling the cutters and entering transverse grooves provided therein, for the purpose of preventing the cutters from dropping out from the grooves and keeping them all in corresponding positions. If this band is of steel, it may be composed of a strip simply rolled into the desired form, and not having its ends united, and it may be sprung into its place, but, if of copper, may be composed of a strip wound around the cutters, and have its ends united by soldering. In either case it will yield or give way, to permit the moving outward of the cutters from the center of the block.

D is a handle screwed into the front end of the block A, for convenience of handling the apparatus. The front end should be hardened if the block be of steel, chilled if the block be of cast-iron, or steel-faced and hardened if the block be of wrought-iron, to prevent the block from being drilled out. The rear end of the block may be so formed as to permit it to pass right up to the breech of the piece of ordnance, to prevent any gunpowder from being inserted through the vent; or it may have a stud inserted, to prevent it from passing up to within a certain distance of the breech.

The cutters may be of various forms; but in any case their points should have a forward direction, to cause them to indent themselves into the metal of the piece of ordnance in case of any attempt to draw out the block, but to permit them to pass with the block backward toward the breech.

To disable a piece, it is only necessary to insert the block A in the bore and push it back either not quite to the charge of gunpowder, if the piece be loaded, or up to the breech, if it be not loaded. In this operation the cutters have their points kept in contact with the bore by the springs, but yield to the friction of their points against the bore, and offer no very perceptible resistance to the passage of a block. When any attempt is made to draw or force out the block by any means whatever, the slightest movement of the block causes the bottoms of the grooves *c c* to act like wedges upon the cutters and force them outward from the center of the block and drive them into the metal of the piece, and the continued application of force to draw out the block causes the cutters to indent themselves deeper and deeper into the metal, and offer an increasing



▲ Full Text  
? Help

Go to Page:

 Go

Sections:

- Front Page
- Drawings
- Specifications
- Claims

Patent Number: 00037946

Section: Claims 3 of 3 pages

Help

2

37,946

resistance to the movement of the block. In case of any attempt to blow the block out by the explosion of a charge of gunpowder in rear of it, the most likely result will be the bursting of the gun. The rear end of the block may be fitted with an expanding packing of any suitable kind to prevent windage in case of an attempt to blow it out by the explosion of gunpowder, as any gas escaping round the block might act upon the cutters themselves to force them down the inclined bottoms of the grooves, and so cause the withdrawal of their points from contact with the bore of the piece.

What I claim as my invention, and desire secure by Letters Patent, is—

The apparatus for disabling ordnance, composed of a block, A, having grooves of inclined bottoms, a series of cutters, B B, fitted to the said grooves, and a series of springs C C, applied to the cutters, the whole combined and operating substantially as herein specified.

ADOLPHUS BONZANO

Witnesses:

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CHAS. T. ALLEN.

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